







# MICHIE'S PRIVATEVIEW

## Prophecies that weren't so far-out



SINCE early days, research workers in artificial intelligence have been accused of uttering wild-eyed prophecies which are then not fulfilled. The chief accusers have been physicist-politicians prematurely frosty for their own role as society's official miracle man. The chief loser has been the taxpayer, whose investment in timely and promising research has on occasion gone to the wall.

But has there not been some truth in the charge? Let us see. Enough time has by now flowed beneath the bridge for it to be possible to compare old prophecies with subsequent developments or non-developments.

As a start, I rummaged in an old article of mine entitled "Computer — servant or master". Published exactly 10 years ago, its first prophecy reads:

"I am fairly optimistic, if that is the right word, about the rate of progress in our own and other similar laboratories elsewhere, in Britain and abroad. I qualify the word 'optimistic' because many people view the objectives of such work with deep unease. If informed that by the late 1970s, the first intelligent machines will be in our midst, their dominant feeling would not be one of optimism, but rather of gloom and anxiety. I shall leave to a later stage the discussion of whether there is justification for these fears — dehumanisation of life, mass redundancy among brainworkers, suffocation of man by surplus leisure, computer-aided snoops and 'thought-police' ..."

I find myself unrepentant of these words. Indeed in 1978 they have acquired a topical ring. We can of course quibble about just what was meant by "the first intelligent machines". But the same article's definitions would certainly apply to some of today's "export systems" (see CW, January 5 and April 13).

A later passage speaks in highly specific terms of a

question-answering facility which will one day become available as a service. Not only schools, hospitals and commercial firms but also the ordinary householder will be able to tap

information and problem-solving power from a national computing grid with the same ease and immediacy as that with which we now draw on central supplies of gas, water and electricity. Along with question-answering services, which will allow us to inquire about restaurants in our locality or politics in Paraguay, will come the games opponent, the puzzle-solver, and the quiz-master. An increasing demand upon computer systems will be for aid in coping in a stimulating way with the growing burden of leisure."

That was written in 1968, 10 years before *yesterday*. Let us turn to some other forecasters. In 1973 forecasts were published of a Delphic survey using techniques employed by large corporations for technological forecasting, and by Chris Evans for a Computer Weekly study (CW, January 26). The essential findings of the 1973 forecast, made by AI scientists from Stanford Research Institute and Lockheed, in the US, are summarised in the accompanying table. Only five years have elapsed since then. Subsequent history has not as yet diverged from prediction. For five of the items the "median prototype date" was estimated for 1978 or earlier. Using the reference numbers from the table we can say the following.

P5. Convincing prototypes exist for computer identification of personnel by signature, voice and photographs. Details of the latter can be got from Leon Harmon, Department of Electrical Engineering, Case Western Reserve University, Cleveland, Ohio, USA.

P8. Working systems exist for congenital heart disease, thyroid enlargements, acute abdominal pain and internal medicine more generally, urinary infections and bacteriuria, and other clinical areas.

P13. "Industrial robot" as used here implies optical and tactile sensing in addition to programmable manipulation. Numerous such devices have now been demonstrated and commercial systems are under development, notably by Unimation Corp. in the US.

P1. Laboratory prototypes are capable of inferential question-answering in addition

to ordinary database interrogation.

P14. Prototype systems allow the customer to place orders by interactive terminal, with computer-generated voice response. Commercial installations are expected considerably earlier than the Delphic estimate of 1983.

But this becomes unrewarding. The noteworthy feature of such forecasts is not, as AI's critics allege, prediction of things which didn't happen, but rather the failure to predict things which did.

Nobody predicted the pattern of distributed intelligence now arising from the microprocessor revolution. Nor has any awareness been apparent of a new hazard from advancing hardware technology, namely inscrutability of ultra-powerful machine problem-solvers. I have aired this topic before (CW, October 27, 1977, January 19, and July 20), and will not return to it, except to re-affirm my belief that certificates of humanoid mentality should be demanded before critically responsible tasks are entrusted to machine systems.

### SUMMARY OF DELPHIC RESULTS

Products	Median Prototype Date	Median Commercial Date
<b>High potential significance</b>		
P5 — Automatic identification system	1976	1980
P8 — Automatic diagnostician	1977	1982
P13 — Industrial robot	1977	1980
P1 — Automated inquiry system	1978	1985
P9 — Personal biological model	1980	1985
P11 — Computer-controlled artificial organs	1980	1980
P18 — Robot tutor	1983	1988
P16 — Insightful economic model	1984	1990
P2 — Automated intelligence system	1985	1981
P20 — General factotum	2000	2010
<b>Medium potential significance</b>		
P14 — Voice response order-taker	1978	1983
P15 — Insightful weather analysis system	1980	1985
P3 — Talking typewriter	1985	1992
P6 — Mobile robot	1985	1995
P4 — Automatic language translator	1987	1995
P12 — Computer arbiter	1988	1995
P10 — Computer psychiatrist	1990	2000
P17 — Robot chauffeur	1992	2000
P21 — Creation and valuation system	1994	2003
<b>Low potential significance</b>		
R19 — Universal game player	1980	1985
F7 — Animal/machine symbiont	2000	2010

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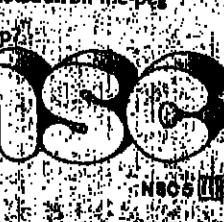
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### PROGRAMMER NOTES

The idea of what constitutes a programming language is called into question by a contribution to the May 1978 edition of the British Computer Society's Computer Journal (Volume 21, Number 2).

The article, by W. N. Holmes of IBM Australia, poses the question: "Is APL a programming language?" It argues that "coding" should be distinguished from calculation — in an occupational sense — and that APL is suited to calculation but not to programming.

"Programming is problem solving, but not just any problems and not just any manner of solving. In the typical modern program is an item of industrial manufacture, created by programmers creating themselves

as members of a team for other people and their work must be done with these other people specifically in mind."

Discussion of programming is dominated by considerations of methods of manufacture, both in respect of its management and in respect of its procedures. Most larger programming projects adopt a top-down approach, starting from the overall design and building the program "first" in broad outline, then in ever greater detail.

The closest thing to a programming language, but not just any problems and not just any manner of solving, is the typical modern program is an item of industrial manufacture, created by programmers creating themselves

"Unlike well written programs, APL function definitions are not fudged for the intended public to browse, rather they are simply APL functions. Alternately, a group of related ideas is expressed as a collection of simple APL functions."

In either case a bottom-up approach is used, contrasting with the top-down approach more suited to programming. This bottom-up approach is the APL notation, the notation for APL usage but should not be confused with the notation is concise.

"The major problem which APL faces is the well meaning misguided efforts to make a programming language out of it. If the APL notation were deliberately developed to make it more suitable for calculation, and programming languages were more deliberately developed to make them suitable for industrial programming, the usefulness of computing machinery would be greatly enhanced."

### SOFTWARE FILE-1

## Six-machine network can be extended to X25, says Prime

A NETWORKING capability has been developed by Prime which allows one Prime computer to be linked with up to four others locally, via interprocessor connection, and with up to two remote machines, via high speed synchronous communication links.

Called Ptimenet — and released with Revision 15 of the Primos operating system — the software is capable of being extended to conform to X25 protocols, according to Prime.

With file sharing, standard calls can be used to manipulate files anywhere within the network. Files may therefore be connected to any Prime computer in the network, in addition to the one logged in to.

Remote login similarly allows a terminal user to log into a terminal user to log into a

system thus offers significant opportunities for the development of distributed processing applications.

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At the same time, the increasing tendency to implement software functions in hardware has been highlighted by announcements from Interdata and the minicomputer division of Sperry Univac (see right).

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possibility of developing an advanced level software interface.

The principal benefits expected are said to be longer life for software products, and the possibility of wider integration of products which might otherwise be incompatible.

In all the studies, the EEC knows a keen interest in the commercial context of the proposals. Contractors are explicitly tasked with investigating the economic viability and acceptability of the proposed products.

The journal also notes that since software development costs are continuously and dramatically increasing, the general economic benefit of a standard interface would not be negligible.

The project, one of three for which the Commission has requested proposals (CW, August 10), is entitled "Study on the feasibility of developing a common software interface for minicomputers".

In the invitation to tender, the Commission specifies a number of tasks which the contractor must undertake.

In one task, contractors are called upon to analyse the possible use of microprocessors for implementing operating system functions, and to assess the impact that this would have on the technical and economic feasibility of a standard software interface.

The program, written in Fortran, currently runs on an IBM 370, and can be accessed by remote terminal. TPA will also sell or lease the software for use on an in-house machine, or for mounting on an agreed bureau.

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**OP SPOT**

By Bernard Allen

# Wages should be linked to output

IT is totally unfair that the wage paid to operations staff is static in nature and therefore in no way reflects the quality or quantity of the work completed by them.

Surely it is time for companies in the computing industry to implement bonus or incentive schemes which link the output of the operations department to the wages of the operators?

Of course some will argue that the shift allowance is the operators' bonus and that on the night shift, at least, they have an incentive — to finish the work quickly in order to get home early.

And admittedly bonus schemes do not really lend themselves to sites where the workload is uniform and where there is lot of spare machine time.

But at sites where the company sells computer time, including the services of the operators, or where there is a lot of testing and development work, they are applicable. At those installations, the amount of work placed upon the operators will be variable.

Any bonus schemes must be based upon the level of throughput achieved by the staff and should also take the amount of "lost" machine time into consideration. The latter is particularly important in the case of bureaux which provide online services.

In relation to downtime, some may say that hardware and software problems are beyond the scope of operations. That is simply not true.

If the operators are working as a team, it is sometimes possible to anticipate problems and so take action to prevent them.

Under any incentive or bonus scheme, it is possible either to lump the whole operations team together or to put all the shifts in competition, so to speak.

With the first method, the operations manager could set weekly or monthly work targets. Anything in excess of the required amount could then be

used as the basis for working out a bonus.

One of the advantages of considering the operations team as a whole is that it will promote co-operation between shifts and the department will become a co-ordinated unit. This, of course, is of great benefit to the company.

However, there might be one shift which does much more work than the others, and if that is the case the combination of the operators into one team is hardly just.

To overcome this problem, the best procedure is this — start a scheme by which the operations department is considered as a whole. If it is evident that one shift regularly does more work than the others, alter the scheme appropriately.

Plain speaking by one of our readers

## Plug-compatible emulation of GE 400 due in April

The reason for a GE 400 emulation is that there are some 200 GE 400s still running in the US, and about the same number spread over Europe, Canada and Japan, and many of these users want more power without the need to change their software. The new machine will be about four times as fast as the old GE 400, and will have a main memory of up to two Megawords.

Telefile's new planning to move up the GE range, developing upgrades for users of the GE 600 and 6000. The latter was the predecessor of Honeywell's Level 60 and was introduced shortly before GE sold its mainframe business to Honeywell. It runs versions of the GCOS operating system little different from those currently running on the latest Level 60 machines.

Telefile also has plans to attack the Burroughs, Control Data and Hewlett-Packard bases with replacement processors as well as add-on peripherals.

Telefile's turnover in 1977 was \$11.8 million, up from \$5.9 million the previous year.

## Level 61 users call for easier upgrade

Our picture shows the generator being lowered into the new building. A moment of some relief for Green Shield, because the company estimates that the company loses £100 for every hour that the computer is down. That may not sound much, but Green Shield explains that it only covers such items as salaries for punch-

### Touchdown at Green Shield

A BIG computer needs a big emergency back-up power source, and few computers in the NCR catalogue come bigger than the Century 300 mainframe used by the Green Shield Trading Stamp Company.

Green Shield has just moved its computer installation to a new site in Edgware, Middlesex, and at the same time invested £28,000 in a 250kVA generator at Auto Diesel in Hatfield, Hertfordshire. Emergency power can be supplied for 13 hours before the 100-gallon diesel tank needs refilling.

girls ride idle by the machine being lowered into the new building. A moment of some relief for Green Shield, because the company estimates that the company loses £100 for every hour that the computer is down. That may not sound much, but Green Shield explains that it only covers such items as salaries for punch-

The two methods of using the program function keys: on the right-hand side of the keyboard are the twelve "physical" PFKs; and across the lower part of the screen is the light-detectable PFK line, numbers 1 to 12.

## The use of program function keys

AN operations team leader contacted me in order to discuss the use of Program Function Keys on his system: an IBM 370/138, running under DOS/VSE Release 34.

At his site the 12 PFKs have a purely hardware function — they are used when the system is in RC, or reconfigure mode.

So I contacted an expert on the matter who informed me that DOS/VSE would support such facility, but only with great difficulty.

He pointed out that such a modification would require the writing of a great deal of assembler code, and would make the supervisor non-standard. He added that he would not even consider carrying out such an operation.

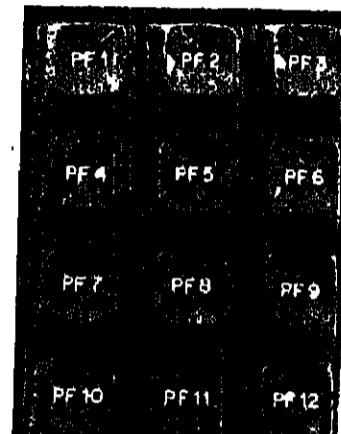
This brought to my notice the stark difference between DOS/VSE and OS/VSE. The latter supports IBM's device-independent display operator console support system, which, thankfully, is abbreviated to DDOCS. With DDOCS, the PFKs are of great help to the operator.

**Figure 1**

The following control command will cause the PFK numbers to be displayed on the screen:  
K D,PFK

**Figure 2**

This command enables the operator to define the PFKs:  
K N,PFK=(xx,CMD="text"),CON=Y or N  
xx: this is the number of the PFK text; the command the PFK will initiate  
Y or N; "Y" means conversational mode, and "N" signifies non-conversational.



The 12 program function keys

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### 600 chps printer now sold in UK

A SINGLE-HEADED impact serial printer with a speed of 600 chps — said to be faster than any similar product currently available — is being manufactured by the International Standard Corp of Melbourne, Florida. Called the PB600A, the printer is now being sold in the UK by Transworld Optical Business Machines Ltd of Richmond, Surrey, the UK subsidiary of QBM Inc which is the sister company of Florida Data Corp.

The PB600A comes with an 8-inch solenoid-driven print head which operates bidirectionally under the control of a Motorola 6800 microprocessor. Quoted performance figures include a throughput of 240 lpm when printing full 122-character lines and 800 lpm with 20-character lines. A quoted price for the PB600A is \$2100 in OEM quantities of 5000.

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### GEC system for private viewdata

From front page

The software took two years to develop, and was written from scratch; it is not based on Prestel viewdata software which is written in the proprietary GEC 4000 series Babbage language and belongs to the Post Office.

Private viewdata services could be set up within organisations providing information for its Prestel service and in addition there would be a charge of £1 per page of information, designed to discourage overbooking of page space.

These proposals have been studied by the Association of Viewdata Information Providers, and a basic editing and bulk update terminal will be about £10,000 over and above the cost of the hardware. The price includes the software and the special keyboard editing disc.

The Post Office has proposed

a fee of £1,000 a quarter for organisations providing information for its Prestel service and in addition there would be a charge of £1 per page of information, designed to discourage overbooking of page space.

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### Exporter gets MSX

MESSAGING switching equipment from Case of Rickmansworth has replaced 12 telex machines in less of raising some £25 million. In a right issue, three-quarters of the 40 million shares offered to existing holders were taken up, and the remaining 5 million are being offered for sale on the Milan Stock Exchange.

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# PEOPLE

## Prizes for three after systems course

TEN students gained NCC Certificates in Systems Analysis this year after completing the one-year part-time course at Watford College. In addition, three were awarded special prizes.

The award for the best all-rounder, donated by Baric Computing Services of Letchworth, went to Keith Deworth, who was working as a social scientist with the DoE's Building Research Station at Garston while he was following the course, but who is now a market analyst with NCR. Baric is a subsidiary of ICL.

Our picture shows him receiving



his award from Mr A. Baston, a member of the Management Studies Advisory Committee.

The local branch of the British Institute of Management made the award for progress in management development. This was won by Bernice Cohen, who took the systems analysis course as part of the complementary studies in the full-time course in Business which she was following at Watford. She is now employed as a DP manager.

The prize for software went to Peter Mueller, a systems analyst at King and Hutchins. It was donated by F International.

Peter Tindall, previously a sales engineer with DES, has joined Applied Industrial Refrigeration Sales Ltd in the same capacity.

Vincent he was responsible for sales of complete package computer rooms with the Computer World Trade Group.

David Harris-White and Pam Quinlan have joined the training division of BIS Applied Systems. Harris-White, who will initially specialise in databases and real time courses, was previously a database analyst with Parker Pen Co. Quinlan, who was most recently with Management and Executive Selection where she specialised in recruiting computer lecturers, will lecture on BIS courses and organise one-day conferences.

Formerly a systems programmer with ICI Organics, James Featherstone joins Perkin-Elmer as a regional support analyst for the North of England.

Bernard Atherton has been appointed divisional general manager of the management services department at Barclays Bank.

Formerly he was assistant general manager of the department.

Ian Smith, formerly manager at Decca's radar service division, has become head of the reorganised field service division at Sintrom Electronics.

Michael Dudley has become director of leasing and broking with IEL International and will be responsible for the monitoring and promotion of leasing in Europe and the remarketing of IEL's CPU portfolio. Previously he was sales manager of IEL UK.

Decca's radar service division, has become head of the reorganised field service division at Sintrom Electronics.

John Newman has joined Quel Automation as systems manager. Datapad. Most recently he was a military advisor in the computing, guided weapons and assessment division at the Royal Signals and Radar Establishment at Malvern.

Ian Harry has been appointed product specialist with special responsibility for component test house and semiconductor manufacturers' sales, with Microsystem Services. Formerly he was an area sales manager with International Rectifiers.

Darayus Mutivala joins Basic Timesharing as UK systems manager, from Dataspab where he was program manager.

**COURSES**

THE University of Salford is offering several short courses on subjects in the computing field this year. They include courses on microprocessors, microcomputers, and their applications; a first course in VLSI training; and computer programming. Basic course for teachers and lecturers. For details apply to the Administrative Assistant, School of Computing, The University of Salford, Salford, M5 4WT. Tel: 061-288 5843.

NUMERICAL Computation is the subject of a one-year Open University course for which no qualifications are required but a knowledge of calculus and matrix theory is necessary. Teaching is carried out through correspondence texts and TV and radio programmes. The application period is mid-October. For further details contact the Associate Student Central Office, The Open University, P.O. Box 70, Walton Hall, Milton Keynes MK1 7AN.

AN intensive course for designers and engineers managing the design of microprocessor-based systems has been organised by Prodesco and will be held in mid-November in Bristol; and then suc-

cessively in London, Manchester and Birmingham. For details contact Prodesco (Semiconductors) Ltd, 79 High Street, Tunbridge Wells, Kent TN1 1XZ, tel: Tunbridge Wells (0892) 38684.

USING small computers in engineering. Choosing a microprocessor, and boundary elements in electrical engineering are the titles of two courses offered by Computational Mechanics and scheduled for September 18-19, October 25-26 and December 12-14 respectively. All will take place in Southampton. For details contact Courses Dept, Computational Mechanics Ltd, 6 Cranbury Road, Southampton SO2 0LG. Tel: (0703) 21307.

THREE courses in computer-aided circuit design are offered by the Department of Electrical Engineering at Imperial College, London this autumn term. They are: Optimisation (September 11), Numerical methods (September 12-14) and Numerical methods (September 13-14). Further information may be obtained from Joan Jeffery, tel: 01-589 8111, ext 1470.

AIMED at programmers who have learned a computer language and want to improve their programming techniques, the course from BIS Applied Systems on Improving program productivity is due to be held on September 11-12 at the Kensington Palace Hotel, London. Details of this and other courses from Dorleens Pavilion, Course Registrar, BIS Applied Systems Ltd, York House, 199 Westminster Bridge Road, London SE1 7UT. Tel: 01-633 6800.

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## Soccer

### Summer Computer League results and tables

Following good wins over Datavision and Rank Xerox, Gryphon are now leaders of Division I. However both Jadpu and SIA have games in hand and are still in contention.

**Results**

**Division I**

Jadpu 4, Comshare 0  
Rank Xerox 1, Gryphon 5  
Datavision 1, Gryphon 3

**Division II**

ICL 1, Altergo 3  
Datavision (City) 1, Atkins 4  
John Lewis 0, Altergo 1  
Altergo 3, Atkins 2  
Atkins 1, Datavision (City) 0

**Division III**

3M 4 2 2 0 12 8 8  
Datavision (WE)

Xerox 1, 3M 2

**Division IV**

Computer Weekly 0, C.J. Bees 2  
Bunzl DS 2, C.J. Bees 0  
UCSL 1, Wellrox 6

**Division V**

CDC 0, Sherwood CC 2  
Hoskyns 3, Jadpu 'B' 3  
Allen CS 5, CDC 5

**Tables**

**Division I**

Gryphon 6 5 0 1 20 6 11  
SIA 3 2 0 1 7 3 5  
Jadpu 3 2 1 0 12 6 4  
Datavision 5 1 3 1 8 16 1  
Rank Xerox 4 0 3 1 8 18 1  
Comshare 3 0 3 0 2 9 0

**Division II**

Targa 4 3 0 1 38 9 8  
Wellrox 5 3 0 2 13 20 6  
Bunzl DS 6 2 1 2 9 14 4  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division III**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division IV**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division V**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division VI**

Gryphon 6 5 0 1 20 6 11  
SIA 3 2 0 1 7 3 5  
Jadpu 3 2 1 0 12 6 4  
Datavision 5 1 3 1 8 16 1  
Rank Xerox 4 0 3 1 8 18 1  
Comshare 3 0 3 0 2 9 0

**Division VII**

Targa 4 3 0 1 38 9 8  
Wellrox 5 3 0 2 13 20 6  
Bunzl DS 6 2 1 2 9 14 4  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division VIII**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division IX**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division X**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division XI**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division XII**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division XIII**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division XIV**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division XV**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division XVI**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division XVII**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division XVIII**

Sherwood CC 3 3 0 0 13 5 6  
CDC 4 2 1 1 14 10 10  
Allen CS 3 1 1 2 5 20 10  
Hoskyns 3 0 1 2 5 20 10  
Jadpu 'B' 2 0 0 2 5 12 0

**Division XIX**

Wellrox 4 3 0 1 38 9 8  
Bunzl DS 5 3 0 2 13 20 6  
C.J. Bees 5 2 0 3 9 14 4  
Comp. Wkly 3 1 1 1 5 5 3  
UCSL 4 1 0 3 5 23 2

**Division XX**

Sherwood CC 3 3 0 0 13

# PCMs fulfil a real need in the industry

By Mike Kitching

THE nature of the question, "Why PCM?" is now nearly academic. Most computer users have been exposed to the many arguments for and against, and the growth of installations with foreign peripherals is reaching sizeable proportions.

The industry, however, is a long way from a true revolution and mainframe manufacturers still largely dominate the direction and philosophy of data processing, although PCMs have had an important effect on product technology, contractual and pricing practices.

It must also be said that the bulk of PCMs have concentrated on the IBM installed base, by far

the most lucrative and wide market segment in the industry. Users who have not carefully considered the possibility of utilising plug-compatible peripherals may benefit from a review of PCM development and the salient elements contributing to their growing acceptance.

The introduction of System 350 heralded the principle of compatibility, including upward compatibility of application programs, a standard method of operation under a microprogrammed operating system, and media compatibility through a standard peripheral equipment interface within the operating

system. Most of these concepts, incidentally, were developed and demonstrated by other manufacturers some years earlier.

With compatibility the PCM industry also began. Through a combination of technological improvements and keener prices, a combination which still holds today, users were for the first time offered an alternative to the total system package offered by mainframe makers. PCMs forced the introduction of single constant tape drives and "voice-coil" motor-operated disc drives, developments which were being held back largely for marketing considerations such

as product life, product differentiation and pricing.

The threat posed by the PCMs was countered and is still being countered with shifts in technology, changes in interfaces, pricing policies aimed at competing with PCMs, and veiled and overt suggestions that the introduction of foreign peripherals would bring about dire consequences — withdrawal of system responsibility and system support, system failure, contractual invalidations, incompatibility, etc.

Today PCMs are active in every peripheral area including media products, and the mixed vendor environment is widely accepted. Memorex in the UK, for example, are present in over 50% of the IBM installations. DP managers have gained a degree of independence from mainframe manufacturers, which they have welcomed above all else, says Mike Kitching, who was appointed managing director of Memorex UK following the merger with Telex UK at the beginning of the year. He had been managing director of the latter since April, 1976. Kitching was previously marketing director of ITT Data Systems.

PCMs have started a trend which has had an overall beneficial effect on the industry, and DP managers have gained a degree of independence from mainframe manufacturers, which they have welcomed above all else, says Mike Kitching, who was appointed managing director of Memorex UK following the merger with Telex UK at the beginning of the year. He had been managing director of the latter since April, 1976. Kitching was previously marketing director of ITT Data Systems.

WHAT is meant by high-speed printing, a term so far unfamiliar in many British computer installations? Essentially it is printing with non-impact output devices at rates in excess of 8,000 lines a minute.

The latent forms image, which cannot be seen yet, then passes across the print head where the variable print data from the computer output is added by electrode stylus which produce a dot matrix of 200 dots to the inch horizontally and vertically. This means that a wide variety of print styles and sizes can be produced.

The quantum leap through to these new high speeds, which can reach up to 18,000 lines per minute and will rise higher, involves a switch in technologies.

To do this requires a complete break with the impact printing techniques found in the typical line printer, which has a top speed of not much more than 2,000 lines a minute.

The paper then passes

through the toner station where liquid ink is applied to a roller.

The charged ink particles adhere

to the oppositely charged areas

of the paper and develop an image. The paper is then dried,

and passes on through perforating, punching and stacking processes.

The secret of the success of this method is, of course, the special dielectric paper. Strides in paper technology during the last few years have made this a more viable proposition.

The argument between the two types of system falls into three main areas — cost, technology and future development.

And the fundamental differences in each of the electrographic and electrophotographic techniques give users a choice of following very different routes.

The basic technological difference is that manufacturers of electrographic equipment have chosen to share the technology of the process between the equipment and ordinary-size dielectric paper, whereas electrophotographic equipment extends the familiar photocopying techniques into HSP (High-Speed Printing) using traditional computer print-out paper.

Whereas the capital cost of electrographic printing systems is significantly higher than that of electrographic systems, paper is, and therefore running costs of electrographic systems are higher.

For instance, typically, Honeywell would charge around £150,000 for a medium capacity configuration in its range of Page Printing Systems, and reckon that equivalent electrophotographic equipment would cost about £230,000.

However, paper costs on the PPS are at the moment higher. They have been as much as 70% higher than plain paper costs on electrophotographic machines. The practical effect of that was that once a user hit the two million pages a year mark on his machine, the cost advantage of the equipment was wiped out in running costs.

Changes in paper costs are, however, altering that vital equation. While the cost of plain paper for electrophotographic machines is likely to double in the next two or three years, dielectric paper will rise at a much more sedate rate, which could reduce the differential between the two to as little as 15%.

This could still create higher running costs on electrographic machines at the highest throughput levels, but it changes the arithmetic in electrography's favour lower down the scale and, as the difference in paper cost narrows, so the electrographic technique will become economic even at the higher throughput levels.

However, the running battle between the technologies is likely to develop some interesting twists during the next two or three years. Because there are two different technologies, attempts by rival manufacturers to improve the performance of their machines will involve radically different approaches.

This, in turn, could affect the capital cost of the rival equipment to varying degrees, again changing the sums which users will have to do.

Take just one development

# Choice of high-speed printing technologies

By John Macdonald

The first stage the paper passes is a forms cylinder where forms are created, thus eliminating the need for pre-printed stationery in most applications.

The latent forms image, which cannot be seen yet, then passes across the print head where the variable print data from the computer output is added by electrode stylus which produce a dot matrix of 200 dots to the inch horizontally and vertically. This means that a wide variety of print styles and sizes can be produced.

And users will have to learn to look outside the traditional data processing budget for the kind of cash savings they can produce. For instance, the ability to sort output automatically by postcode as part of the printing mechanism means that savings can be achieved in bulk postage rates.

Other savings are made by computerising jobs which previously would not be computerised because the quality of the print was inadequate, for instance, direct mail shots.

The fact that the end-product from the electrographic technique can be an A4 size printed page rather than the traditional unwieldy print-out paper would mean greater savings and convenience in storage and filing.

Finally, there are major savings in the operational costs of post and printing activities.

an unfamiliar technology.

## The minicomputer company in INDUSTRY

### Programmer power

From page 11

does to make the terminal operator's job easier reduces the chance of errors creeping in. Some editing terminals not only allow the programmer to define numeric-only fields, but also cause the keyboard to lock if that format is violated.

Since groups of data which are meaningful in the application sense probably do not correspond exactly with one or more lines on the CRT screen, more efficient use can be made of the screen's limited capacity through the message approach.

Some editing terminals may be used either conversationally, or in block mode, again adding to the range of applications they can support and help out in debugging.

Other useful transmission types include the ability to send everything, to send just those fields containing modified data, or to send just unpredicted data. The Request-To-Send mode is a big help to the system designer who wants to make optimum use of the host main memory. In this mode the terminal sends a three-character code to the host

when any send key is depressed. This informs the program that data is ready for transmission and specifies which send key (or function key) has been used by the operator. After identifying the depressed send key, the program allocates the necessary storage and issues a "read" code to initiate transmission of the data.

The Request-To-Send mode can be used with any of the transmission types. In addition, as part of the "read" the host is free to ignore the operator's choice of send key and read everything, modified data only or protected data only, by line by page or by message.

In this mode of operation, the host is in control, not the terminal operator. The host need not read a terminal until it is convenient to do so, and until it has available a buffer for the transmission. The buffer can be much smaller than a full page if the send line or send message capabilities are used. These main memory and time savings are especially important to the growing numbers of minis and even micros finding their way into small multi-terminal online systems.

Take just one development

in paper costs are, however, altering that vital equation. While the cost of plain paper for electrophotographic machines is likely to double in the next two or three years, dielectric paper will rise at a much more sedate rate, which could reduce the differential between the two to as little as 15%.

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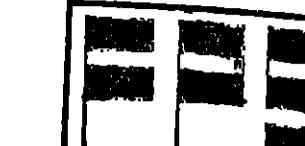
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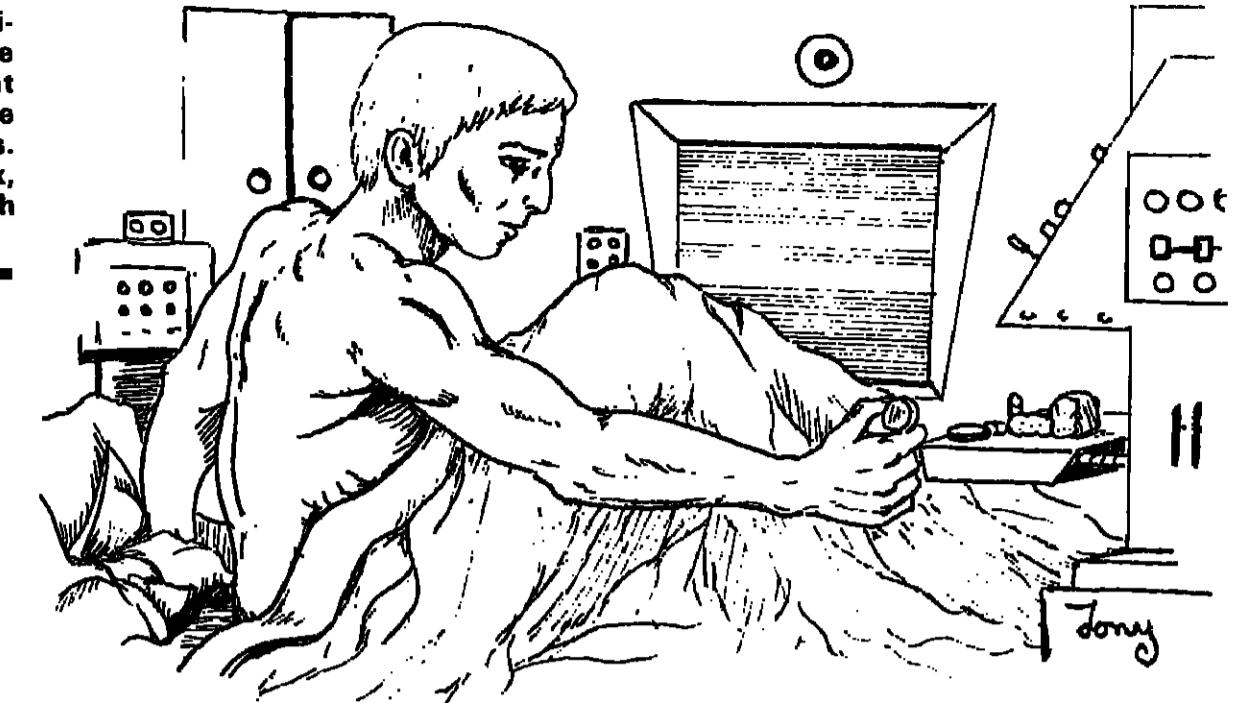
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One of the two special prizes in the Computer Weekly/Dataskill essay competition, Computerstyle 2000, went to PAUL HOLDEN of Dublin, whose entry appears below. Holden, who works for Applied Management Sys-

tems, sees life as clinical, uniform and regimented. The hero, Stoddard, dreams at night of a different culture based on small communities. Just as he reaches the climax, the machine wakes him with the next day's timetable ...



Our hero, after being given his timetable for the day, consumes his regular breakfast. Experience had taught him not to omit it or for that matter, any of the ingredients in the meal was dangerous. One visit to the infirmary was enough.

# 'Good morning Stoddard, here is today's timetable ...'

SLOWLY, the euphoria drained away. He couldn't hold on to it. He was being dragged down. His head felt numb, and he was unable to focus on anything. The spark of light went out.

He crawled out of bed, and the luminous cursor appeared on the screen and began its tireless dance, leaving behind it a string of words.

"Good morning, Stoddard. Here is your timetable for the day."

It always began like that. He remembered, with faint amusement, how it had once bade him a happy new year three days in a row. Now it was always "good morning." Somehow, he felt, programs with bugs were more interesting.

He took the plastic plate to a table where three people, two women and a man, were already seated. He vaguely recognised two of them, but was embarrassed that he could not recall their names. He had never seen the blonde woman before. The three were talking when he sat down, discussing the weather.

"My friend in Weather," the taller woman was saying — Kama, that was her name — "told me that tomorrow would be fine, but that they had to arrange some rain for Wednesday. Something about visiting foreign dignitaries."

"Well, I hope they give us a decent summer this year," the man, his mouth full of the brown fibrous stuff, spoke up, "not like the last few years. One week

sunshine, one week rain. Those guys in Weather have no imagination." The group fell silent, and Stoddard could not think of anything to contribute to the conversation.

"Though he saw no sense in it, he knew, or rather he felt, that it was not worth bothering to ask. There was no one to ask. No screen would respond to imperious questions like that. Other citizens grew up like him, were educated like him, lived like him. They conformed, because it was impossible to consider an alternative. Whenever a stray doubt crossed your mind, the feeling of being watched intensified. The screen seemed to grow brighter. You learned not to think those kind of thoughts. It was more comfortable."

His breakfast came out of the lot. It was the usual combination. Two slabs of white cellulose lay on the plate with half a dozen pills. He knew that the bread, a tasteless mass, was only to supply bulk, and that the pills contained all the nutrients considered essential by the Department.

For the afternoon, his instructions were different. He was to report to the gymnasium for a programme of exercises.

"Sport," they called it. This started appearing on his timetable some weeks previously. He had mentioned one day at lunch that he felt tired. Now his programme was such that he flew about each day, each afternoon truly exhausted.

He was on his timetable. Always, the screen knew where he was, because he was where he was told to be. The screen had told him to be, and in each place, the screen

reminded him of his duties, where to go next and what to do there. He did what he was told.

The complex had a canteen in the basement. He had lunch there, along with the hundreds — maybe thousands, he never knew — of others in front of the dispensing machines, who placed their hands on the pad, and were delivered personalised meals through a slot. The ingredients were carefully calculated to supply the correct nutrients for their weight and height. The meal consisted of some tasteless bulk and a handful of pills.

He was helped to the canteen by white-coated orderly. There was a queue in front of him — twisted ankles, like himself, cuts and bruises, and a couple of middle-aged men who had clearly overdone it, he thought. They were coughing and gasping for breath. The queue moved slowly.

He came out with his ankle bandaged up, grateful that they hadn't sent him to the infirmary. It was dark. The screen told him to report directly to the Entertainment Centre.

When he realised that he had missed dinner, a strange feeling overcame him. He remembered the last time, and he felt sick, with a mixture of fear, excitement and hunger.

Nausea gripped him during the mating session at the Entertainment Centre. It was beyond him that people used to enjoy this. As soon as he could, he went to his room, took the pills and lay down. The screen went blank.

The empty feeling in his belly swept up and over him, filling his head with a sort of lightness. When he closed his eyes, the world became more vivid, more alive. He entered this world.

He knew that the bread, tasteless mass, was only bulk and that the pills contained all the nutrients considered essential by the Department.

The first rays of the sun were playing with the drops of condensed moisture on the window when he opened his eyes.

Somewhere a buzzer sounded, and the three stood up to go, nodding at Stoddard on their way.

He knew that the bread, tasteless mass, was only bulk and that the pills contained all the nutrients considered essential by the Department.

And they repair agricultural machinery.

"Hey," Stoddard himself spoke, "find out if anyone knows anything about grain mills. If we

The large screen displayed his target — 10 laps at 20 kilometres per hour. It showed that he had completed seven laps at 28.5 kilometres per hour, when he fell. He limped painfully to the console, and reluctantly, requested assistance.

He was helped to the canteen by white-coated orderly. There was a queue in front of him — twisted ankles, like himself, cuts and bruises, and a couple of middle-aged men who had clearly overdone it, he thought. They were coughing and gasping for breath. The queue moved slowly.

He came out with his ankle bandaged up, grateful that they hadn't sent him to the infirmary. It was dark. The screen told him to report directly to the Entertainment Centre.

When he realised that he had missed dinner, a strange feeling overcame him. He remembered the last time, and he felt sick, with a mixture of fear, excitement and hunger.

Nausea gripped him during the mating session at the Entertainment Centre. It was beyond him that people used to enjoy this. As soon as he could, he went to his room, took the pills and lay down. The screen went blank.

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cold. Jobina was already sitting at a terminal, occasionally jotting down some notes on a pad. Orchard was looking over her shoulder. As they came downstairs, they each helped themselves from the large black pot of oat porridge that had been on the stove all night and sat at the long table. They ate in near silence, and then began planning their activities for the day.

Their specialty was carpentry, and their skills were much in demand. Jobina reported that

"Okay, but warn them that they'll have to wait a few weeks for their table."

The group split up, some going to the workshop, some to the fields. Stoddard and Jobina took the truck to a commune situated about ten kilometres distant, where they were needed to replace some floorboards and fix a rail on the stairs.

The group split up, some going to the workshop, some to the fields. Stoddard and Jobina took the truck to a commune situated about ten kilometres distant, where they were needed to replace some floorboards and fix a rail on the stairs.

There were orders in for five kitchen tables from communes within sixty kilometre radius. They were committed to supply three of these within a month. The other two were the subject of discussion.

"But what have they got?" one of the men was saying. Canace entered; a few words on the keyboard.

"They have leather and onions."

"Sounds like last night's dinner," someone interrupted, laughing.

"And they repair agricultural machinery."

"Hey," Stoddard himself spoke, "find out if anyone knows anything about grain mills. If we

can get that old one fixed up, we can save ourselves about three hours' labour a day."

The screen flickered in response to Canace's fingers.

"Not in South-West-Nine. But hang on a minute, someone in South-West-Three can fix the mill, and they need onions and a pair of shoes. So we can do the deal with South-West-Nine through South-West-Three."

He had registered this particular interest of his with the educational index a few months previously and had met two others who were interested in the same line of research. One was an 83 year old man who had been pursuing the same line for over 20 years, and who was able to help Stoddard a lot.

The other was a woman of his own age. The three of them met about once a month, but if anything really significant turned up, they could communicate it to the others within minutes.

Dinner that evening was a feast. Orchard had spent the afternoon at the river and had caught half a dozen fine trout. To celebrate the occasion, they opened a bottle of wine and the evening became a party, with music, song and dance.

When darkness fell, they went to bed. Stoddard lay beside Jobina. "D'y know," he said, "every time I eat fish, I have nightmares."

She laughed. "Don't be silly. It's just your imagination."

"I hope so," he replied. "I really hope so."

But the effect of the wine was wearing off. Slowly the euphoria drained away. He couldn't hold on to it. He was being dragged down.

His head felt numb, and he was unable to focus on anything. The spark of light went out.

A CONFERENCE aimed at senior management and the Profitable Exploration of Microprocessor Technology has been organised by European Computer Conference and will take place at the Hilton Hotel, London W1 on September 11-12. Speakers will include Christopher Stuart, Trevor Gilpin and Christopher Evans from the Data General Sherman division of ASTMS, and J. G. Roberts from Praxis Instruments. Further details from ESC Ltd, Kirby House, 21 High Street East, Uppington, Rutland LE12 9PV, tel: Uppington (0167) 422711.

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A CONFERENCE on the applications of microprocessors in communications will be held on September 12-14 at the University College, Cardiff, Wales. The conference may be obtained from Mrs M. W. Egan, Dept of Civilian

Engineering, University Col-

lege, Newport Road, Cardiff CF2 1AA, ext 7073.

A THREE-DAY seminar entitled Team Management and organised by Computer Management will be held on September 14-16 at the Polytechnic of Central London. A three-day supervisory course will run concurrently with the workshops, and there will also be a display of equipment.

For further details apply to Management Studies Centre, 81A George Street, Richmond, Surrey TW9 1HL, tel: 01-940 5656.

VIEWDATA — the paperless office — was a seminar presented by Miles and Allen Communications on June 21. It will be repeated on September 27, with the addition of a session by Ken Knight entitled Introduction to Viewdata. Further details from Miles and Allen at Broadwick House, 18-19 Broadwick Street, London W1A 1AH, tel: 01-439 2601.



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RW 33/1

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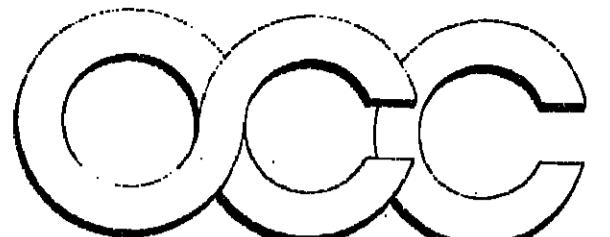
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With a major upgrade in hardware scheduled for the near future, and a corporate development plan agreed, our client's commitment to D.P. is well established. As a result of this they are able to offer an attractive future to analysts wishing to pursue an active career path, and gain experience utilising Database and Distributed Processing techniques.

If successful, you will probably have been involved with the development of at least one complete system beyond that, no specific experience is asked for, only confidence in your own ability and a desire to reach the zenith of your chosen career path.

The company offers an attractive benefit package in addition to the basic salary, and provides a modern and pleasant office environment. These positions are true opportunities for career advancement and can lead to an exciting and demanding future.

Ref. W1/1708

## COBOL PROGRAMMERS

### CITY OR HOME COUNTIES

C £5000

We wish to appoint a COBOL Programmer for our client, a large, well established organisation with diverse interests.

The company has offices in the City and in the Western Home Counties and successful candidates can be based at either location.

Applicants should be able to offer from one year's COBOL programming experience gained on Honeywell, Univac, Burroughs or IBM hardware. There are opportunities to gain more user contact, eventually progressing to systems analysis. Alternatively programmers can progress into the more technical software development area to broaden their knowledge of the industry.

The position carries an attractive salary which is further supported by financial benefits making a comprehensive and generous package.

Ref. E1/1708

## E6500 ANALYST/ PROGRAMMERS

If you can offer one or more of the following, our client can offer you the opportunity to consolidate your career with a 3rd generation environment

- ★ IBM 370
- ★ COBOL or ASSEMBLER
- ★ SYSTEMS DESIGN/IMPLEMENTATION
- ★ PROGRAM SPECIFICATION
- ★ FEASIBILITY STUDY

Because of the competitiveness of their business, it is considered essential to utilise modern computing techniques wherever possible, so the demand for data processing systems within the group continues to rise significantly. Two additional Analyst/Programmers and four Programmers are now required to strengthen the department and the salaries range from £4500 to £6500 depending on experience.

Conditions of employment are above average and the location is a quiet and attractive district of Surrey. Ref. S1/1708

## PROGRAM YOUR OWN CAREER

### N.W. LONDON

C £5000

Our client, one of the largest companies in their select field of operations, are keen to keep pace with the latest advances in computing hardware and technology.

They have recently installed a large mainframe in their London offices to support on-line systems from their regional centres.

They are now seeking to develop applications to streamline their services and require COBOL programmers with a minimum of one year's commercial experience who can generate the professional enthusiasm to assist with the introduction of the new systems.

The successful applicants will be working in an environment where DEVELOPMENT as opposed to maintenance, with DATABASE, and on-line programming techniques are available. The company also offer competitive salaries, four weeks' holiday, pension schemes, flex-time and a staff purchase scheme.

Ref. N1/1708

### 24-hour answering service

Please telephone for a confidential discussion or write to:  
30 Fleet Street London EC4Y 1AA  
01-353 0981

## UNIVERSITY OF LIVERPOOL COMPUTER LABORATORY

Applications are invited for posts in the following areas:

### MICROPROCESSOR

### HARDWARE

### MICROPROCESSOR

### SOFTWARE

### GRAPHICS

### CAMPUS NETWORKS

### GANNET GEORGE 4

### DATA CAPTURE AND

### ANALYSIS

### OPERATIONS

### CO-ORDINATION

Appointments will be made on the following scales (under review).

Programmer/Analyst £3732-£5073

(inclusive of supplements)

The successful candidate will join a team developing a variety of applications, including on-line systems.

In September, the Authority will take delivery of an ICL 2980

which will replace the present 1902S. The new machine will initially be run using DME/3 and use of VME/K is planned.

Applicants (male or female) should be suitably qualified,

preferably to degree level or equivalent, and must have a knowledge of COBOL. Starting salary will depend on qualifications, experience and age.

Application forms and further details may be obtained from The City Treasurer, The Council House, Corporation Street, Derby DE1 2FE (Derby 31111 ext. 818 or 828). Closing date — August 31st, 1978.

Our principal tools for this development will be:

### DOS/V UNDER VM

### CICS

### DL/1

### COBOL WITH ON-LINE PROGRAM

### DEVELOPMENT

Application forms and further particulars may be obtained from The Register, The University, P.O. Box 147, Liverpool L69 3BX.

The closing date for the receipt of applications is 16

September, 1978 and it is expected to hold interviews

towards the end of September. Quire Ref. RV/B91/CW.

## ANALYST/ PROGRAMMER

### SELLING

An experienced PLAN/COBOL Programmer with some knowledge of systems analysis is required for our city centre ICL 2980 computer installation utilising magnetic tape, EDS 60s and Key Edit data entry.

Salary will relate to experience and qualifications.

Conditions of employment are attractive and include contributory pension fund (additional to State Scheme), four weeks' holiday after first year, staff discount scheme and sports and social club facilities.

Applications in writing to:

Manpower Planning Manager  
Lincs Co-operative Society Ltd.  
Personnel Services Division  
7th Floor, King Edward House  
138A New Street  
Birmingham 2 401

SENEA (UK LTD.) REQUIRE A SOFTWARE PROGRAMMER

FOR A 16-BIT MACHINE WORKING ON EXCITING REAL-TIME PROJECTS. Salary £7,000 plus usual perks. Working in a happy atmosphere with a small, friendly staff.

Write to: Mr. A. E. Turner

SENEA (UK LTD.)

13 HERMATAVE PARADE

ASCOT, BERKS





# Consultants, Analysts and Programmers Make your career with Control Data

**Control Data**, a world leader in the provision of computer products, services and consulting, has an on-going investment in advanced products, services and technology.

As a result of increased business activity we are expanding our Professional Services Division and the following new positions now arise:—

**DATA MANAGEMENT CONSULTANTS:**  
Salary £6000—£9000

To advise clients and ensure that their problems are resolved with the best available solutions and to work with them to a successful conclusion.

**COMMUNICATIONS SOFTWARE CONSULTANTS:**  
Salary £6000—£9000

To advise clients on their data communications requirements and work with them—individually and alongside the various other divisions of Control Data—in developing and implementing the most suitable hardware/software solution.

**SYSTEMS SOFTWARE ANALYSTS:**  
Salary £5000—£7000

To work in pre-/post-sales environments with Control Data's Cyber 170 operating systems, particularly NOS/BE.

**SCIENTIFIC APPLICATIONS ANALYSTS:**  
Salary £5000—£7000

To provide customer and sales support for Engineering and Management applications such as:—Civil/Structural/Mechanical engineering; Pipe Stress Analysis; Linear Programming; Financial Modelling; Statistics; Project Planning/Control; Graphics (both passive and interactive).

If you are looking for something different, a chance to stretch your abilities, and a real career opportunity—JOIN US.

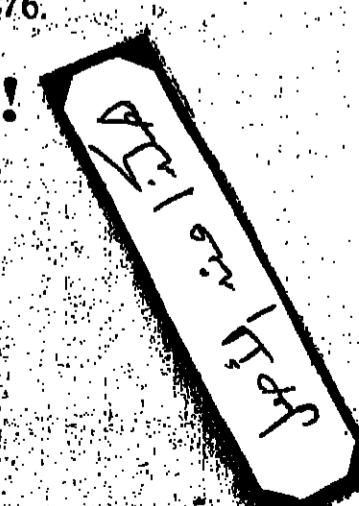
We offer large company benefits including re-location expenses where relevant and the possibility of travel.

For further information contact Bruce Jones or Sylvia Nuth at 79 Wells Street, London, W.1. Tel: 01-637 0176.

**It could change your way of life!**



MORE THAN A COMPUTER COMPANY



## INDUSTRIAL SYSTEMS EXPERIENCE? Excellent Development Opportunities for SENIOR DESIGN CONSULTANTS PROJECT LEADERS PROGRAMMERS

If you have at least 5 years' experience supporting your solid engineering software background in industrial automation systems and an in-depth working knowledge of any of the following:

PDP-11, RSX-11M, MACRO II, CORAL 66, PASCAL, ASSEMBLER

then, we can offer you a choice of challenging positions.

SALARY RANGES . . . Permanent Staff . . . to £10,000 per year  
Contract Staff . . . to £300 per week

For full details of these and many more interesting positions ring JIM-FORT on 01-262 2251.



## Programmers

### Geophysical Division

We require programmers for vacancies in our Geophysical Division in London and our Geophysics Research Branch at Sunbury-on-Thames. This latter Branch is expected to relocate to London within the next twelve months.

In London the work, involving the use of both Fortran and Assembler, consists of developing and maintaining new and existing software for processing seismic data. We have two Texas Instruments TIMAP systems which are dedicated to seismic processing and our programmers work in close liaison with the Geophysicists using this system.

In Sunbury the programmers assist Research Geophysicists in the design, development and application of data enhancement techniques in seismic prospecting. The work will be concerned with a general purpose system (UNIVAC 1110) and the TIMAP systems.

We are seeking applicants with at least two years' programming experience, preferably with a seismic system. A degree or equivalent in Maths, Physics or Computer Science would be a definite advantage.

Our current salary levels together with a non-contributory pension scheme, subsidised lunches and excellent sports and social facilities now represent outstanding conditions of employment.

Please write giving brief details of age, qualifications and experience, quoting reference FV 581, to The Manager, Central Recruitment, The British Petroleum Company Limited, Britannia House, Moor Lane, London EC2Y 9BU.

## Systems Engineers Switzerland c. £18,000 p.a.

Are you a Systems Engineer who's looking for a job that's a little bit different? A job which is secure and yet offers challenge, variety, a wide range of equipment, and international connections? Read on—we've got what you want.

Itei is one of the world's largest suppliers of IBM-compatible mainframes, marketing and maintaining a wide range of products throughout Europe, the United States, Africa and the Middle East. As a result of our continuing expansion, we are now seeking two additional Systems Engineers for our Swiss operation: one to be based in Berne, and the other in Zurich. In each case, after one year's service the job-holder will be given the option of relocating elsewhere in Europe.

Candidates should have experience of IBM large systems, and should be prepared to offer both pre and post sales technical assistance to the marketing staff when required. In addition, they should be able to rectify problems which occur in as many of the following operating systems as possible: OS, VS/1, SVS, MVS, JES2, JES3, HASP.

This is an unusual opportunity to join an expanding international company where job interest is high, and where salary plus benefits reflect your status as an expert. Why not find out more? Send a CV or make a reverse charge phone call to Barry Martin, Itei International (Europe) Corporation, Bowater House, 68 Knightsbridge, London SW1. Tel: 584 5050.



Data Processing Recruitment Consultants

## Analysts+Programmers Manchester

Salaries: c. £5 - 9K

Our client is a major International company recognised as market-leaders in their field and has retained Logistix to assist in recruiting the following Key project-team specialists: Real-time mini programmers, Data base designers, compiler specialists, communications experts (Mint and Mainframe), Application and Software programmers. Experience of any of the following will be especially welcome: RSX-11, RTLI, BASIC, ASSEMBLER, PL/I, COBOL, IMS and

D.B. For those who enjoy overseas travel there will be ample opportunity to visit European and Middle-East locations at which our clients have offices. Successful applicants are likely to demonstrate qualities of leadership potential, determination and be self-starters. It is anticipated that you will achieve very rapid promotion within this prestigious company. Interviews will be held in Cheshire during August and offers will be made before month's end.

## IBM Contracts E.E.C.

Rates: £9 - 13 per hour + overtime

\*IMS DB/DC Analyst programmers Switzerland  
\*IMS DB/DC Analyst programmers Paris  
A sound knowledge of either COBOL or PL/I is essential for programmers and Assembler in the case of Systems programmers.  
Contracts range in duration from 8 weeks to 9 months but only those available within the next three weeks can be considered for these posts at this time.

## Systems Engineers+Programmers Brussels+Thames Valley

Salaries: to £15K (E.E.C.) £9K (U.K.)

An internationally respected supplier of Data Base and Teleprocessing Management Systems requires for its Belgian and U.K. operations several Systems Engineers and Programmers up to consultant level. You should have current experience in the implementation and support of Data Base and/or Real Time Systems. In particular exposure to any of the following — IMS, CICS, TOTAL, ENVIRON, TASKMASTER, SHADOW or ADABAS is highly relevant. Candidates for the Brussels positions should ideally (although not essentially) have some French language ability. Additionally, there is a requirement for the U.K. based staff to travel within this country and occasionally to E.E.C.

Supplemental to a high salary, you will receive extensive benefits including full relocation expenses, life and disability insurance, pension plan, overseas allowances and liberal mileage allowances. Above all, these positions carry excellent prospects.

Interviews will take place within fourteen days of the appearance of this advertisement.

## Honeywell Level 66 Benelux

Salary Range: £12 - 16K

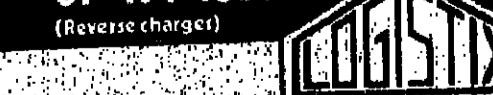
Our client is a major International Hardware and Software Systems supplier currently developing new systems in a multi Honeywell Level 66 environment. We invite applications from Senior Programmers, Analyst/Programmers and Systems Designers who have had a minimum of two years continuous experience in one or more of the above capacities on Level 66 hardware. Candidates should preferably have had exposure to GCOS, IDS ISP or TDS, whilst the programming languages used are primarily COBOL and

## Micro or Mini Specialists London+Home Counties

Salaries £5 - 9.5K + Overseas Travel

Micro-Processors preferably Intel 8080/8, Zilog Z80 or Motorola 6800 will be ideally suited. In addition to an above market starting salary our clients offer excellent career advancement prospects and the opportunity to travel within Western Europe. Initial interviews on our clients' premises will be held before the end of August.

Logistix, Freepost 32, London W1E 3YZ  
01-491 4636  
Telex 28800



Avon House, 366 Oxford Street, London W1N 9HA

# An exciting future for you and London

...in a job that really counts

## RIGHT NOW...

Your chance to get in on exciting computer projects destined for rapid expansion into the 1980s... You'll be working for the largest regional authority in the country providing a wide range of vital services for Londoners.

## An outstanding opportunity

Because you'll find a rewarding career-as we move into our big expansion programme.

Because you'll be working with top computer systems - We've already installed:

IBM 370/158 (1½ MB) IBM 370/145 (¾ MB) PRIME 300

but the mainframes are being extended by the end of this year to

IBM 370/158 (3MB) IBM 370/148 (2MB)

### FUTURE PLANS:

- 2 IBM 3031 (1MB each) by August 1980

- Moving from VSI to MVS

- Extending the network beyond the present 150 terminals.

Because you'll be having a direct impact on people all over London.

Because there'll be real variety in the work -

Personnel Systems...Housing...Finance...Transportation...Engineering...

Information Systems...Data Base...Distributed Processing...CAD

Because we offer:

- comprehensive sports and social facilities - ranging from riding, squash, tennis to discos and drama
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- interest free season ticket loans
- generous holidays - over 5 weeks a year
- plus one day extra off per month
- flexible working hours
- ideal location - close to British Rail, Underground and bus services - close to South Bank Arts Centre
- training opportunities



## Systems Programmers £4819-£6643

At least 2 years experience of IBM software - and able to work in a team. You will be working with a specialist team generating, developing and maintaining OS/VSI, CRIE, CICS, RES, DL/I, ATMS/STAIRS, MVS, ADABAS, IPS, PLANCODE, ICES & MOSS.

## Systems Analyst/Programmers £4819-£6643

At least 2 years IBM experience, including designing, specifying and writing programs. Knowledge of BAL or PL/I or FORTRAN is essential and experience of teleprocessing systems would be an advantage.

### ACT NOW...

• Ring Geoff Dalby (01-633 2038), Program & Support Manager, or George Goodwin (01-633 7793), Development Manager, to discuss a career in computing at the GLC.

• Contact Corinna Furse (01-633 3035) for an application form, or write to her at Central Computer Services, Greater London Council, Room 296, County Hall, London SE1 7PB

## GLC Central Computer Services

HP 1 in 11A

## SPAN COMPUTER PERSONNEL

### SMART EUROPEAN OPERATOR

Our clients, an International Banking Organisation, require a smart, intelligent operator to work in BELGIUM. Salary c. 75k.

You should have the initiative and freedom to take on this challenging post which will eventually lead to a progressive career path within the group, and could provide moves all over Europe.

You will possess good communication skills in addition to solid background in Computer Operations. A mini computer background would be ideal but other experience, particularly IBM 370, would be considered. Reporting to the European Technical Services Manager, you should possess some expertise in Teleprocessing.

Any foreign languages spoken would be an added bonus but above all the pre-requisite is for high calibre technical skills and an ambitious outlook on life.

Please reply quoting ref. GD 1500

**CONTRACT OPERATORS**

We have many positions coming available in the near future please telephone for further details.

2 HOBART PLACE LONDON SW1 01-235 3215

UNIVERSITY OF EDINBURGH  
DEPARTMENT OF ARTIFICIAL INTELLIGENCE  
RESEARCH ASSOCIATE (SYSTEMS/APPLICATIONS PROGRAMMER)

A Research Associate (systems/programmer) is required to support the Department's minicomputer programming and research programme. Duties will include implementing, documenting and testing innovative fast processing programming language, the Department's DEC PDP-11/60 computer under UNIX, and developing applications software to be used by members of the academic staff. Applicants should have a degree or equivalent qualification in computer science or a relevant discipline, experience with DEC PDP-11 computers would be an advantage. Salary up to £10,000 + £1,000 in Range 1A scale £3,860-£4,710 according to age, qualifications and experience.

Further particulars may be obtained from Dr. Huwe, Department of Artificial Intelligence, University of Edinburgh, EH1 2EL, Tel. 031-552 2011, with whom applications, together with the names and addresses of two referees, should be lodged not later than 15th September 1978. Please quote reference 8043.

UNIVERSITY OF NOTTINGHAM  
Department of Psychology

Experimental Officer (Computing)

Applications are invited for this recently-created post which requires someone with software expertise to provide and develop systems resources for our new computer system. The maintenance of documentation and system software and the provision of advice and assistance on programming problems will also be part of the duties. The Department has a multi-access PDP-11/34 machine running RT-11 and UNIX, and satellite GT-1 and LS-11 connected via a local area network. Candidates should have a degree in an appropriate discipline and have a qualification in scientific and laboratory computing.

Salary will be on the scale 1B £3,189 to £4,801 p.a. (under review) according to age, qualifications and experience. Applications should be submitted to the Staff Appointments Officer, University of Nottingham. Forms of application should be returned by October 1st 1978. Ref No. 024.

TEESSIDE POLYTECHNIC COMPUTER CENTRE

PROGRAMMER ANALYSTS (4 Posts)

The Computer Centre provides a service to the whole Polytechnic and has just installed a large Univac computer. A wide range of programming is undertaken, including systems analysis and design, development of applications software for the academic departments, the Library and the Administration. Programmer Analysts should preferably be able to demonstrate an educational standard and preferably have two years programming experience.

The starting salary will be at an appropriate level on entry, rising to maximum of, at present £9,073.

Applications for further particulars may be obtained from Assistant Secretary (Academics), Teesside Polytechnic, Middlebrough, Cleveland TS1 3SE. Details to follow. They shall be returned as soon as possible.

## OPERATIONS PERSONNEL

### I CAN FIND YOU A BETTER JOB THAN YOU CAN FIND YOURSELF

Having spent 10 years in Computer Operations, I understand and appreciate the problems involved when you contemplate a move.

Operations staff usually get the thin end of the wedge from most Recruitment Companies, but we at Span take the trouble to listen to your requirements before we act on your behalf.

Please telephone me, Glen Donnelly, so that I may be of some assistance to your search for a new position.

## CONTRACT OPERATORS

We have many positions coming available in the near future please telephone for further details.

2 HOBART PLACE LONDON SW1 01-235 3215

## UNIVERSITY OF EXETER FACULTY OF SOCIAL STUDIES

### PROGRAMMER III

The Data Processing Unit in the Faculty of Social Studies requires a Programmer III to join a team of four programmers. The Unit is an RJE link to the University IC 4-72 computer.

The work is mainly of a statistical nature in the creation and analysis of data banks and preferences will be given to applicants with extensive experience of programming in a high level language and a knowledge of statistical packages. Applicants must have a university degree in a relevant subject but previous computing experience is not necessary as training will be given.

Salary according to qualifications and experience, up to £4,710. Tel. 0302-63004 4111.

Letters of application, stating the names of two referees should be sent to Miss Doreen Waud, Admissions Officer, Department of Social Studies, University of Exeter, Exeter, EX4 4QD, by 11 August 1978. Please quote reference No. 8026.

## SYSTEMS ANALYST £4750-£5250

### NORTHAMPTON

We require a systems analyst to participate in systems development in existing and new design areas for our on line real time system consisting of a B3700 and a nationwide data communications network with 40+ remote terminals.

Applicants with a programming background should have 18 months commercial systems experience (preferably involving on line or data base work).

Relocation assistance will be available if necessary.

Please send career details to Martin Jones, Robert Home and Co Ltd., Huntsman House, Mansion Close, Moulton Park, Northampton. Tel: 01-531 9131

## Satellite Hardware Checkout Systems Netherlands £10,000+

Logica offers permanent staff positions for analysts and programmers to work on the development of satellite hardware checkout systems in the Netherlands.

You should have experience of high level language real-time programming on minicomputers. Knowledge of CORAL and Modular One experience would be particularly useful.

You should be keen to live in the Netherlands and work in an international agency in which English is the working language. Assignments will be for a minimum of one year with possible extension.

Total earnings for candidates with suitable experience will be from around £10,000.

Call Paula Freed on 01-637 9111 or write to her for an application form - Ref. CGR/H. Logica Limited, 64 Newman Street, London W1A 4SE.

If you're good, we can help you go further

100ica

## Software Support Analyst Saudi Arabia £10,000 tax free

Software Support Analyst to manage a Prime 300 system in Saudi Arabia. An outstanding person with a knowledge of PRIMOS and FORTRAN who will make a creative contribution to our software, adapting the system from engineering disciplines to newly identified market-needs in commercial applications such as payroll, inventories etc. In addition to a salary of £10,000 tax free, you will receive accommodation with a two year contract and 15 days leave every 15 weeks. Interested candidates should write immediately (confidentiality is guaranteed) to the Manager International Distributor Operations, Box no 1976, Computer Weekly, London.

## Contracts EXPERIENCED FREELANCERS AND NEWCOMERS

If you have the following:  
DIS/VIS PL1  
PDP/11 MUMPS  
CORAL 66  
IBM IMS

Telephone: MANHATTAN on (01) 531 9131

We also have a limited number of vacancies for graduates with 6-18 months experience.

## At least 2 years' OPERATIONS experience?

If you are a freelance operator now, or intend to go freelance in the near future, contact us for details of our current and future assignments in all areas of the U.K.

The ability to communicate and an intelligent attitude towards freelance work is considered essential.

## IMMEDIATE

### OS JCL WRITERS — Long contracts in the South

### IBM OS VS1/2 OPERATORS

### IBM DOS VS POWER OPERATORS

### IBM DOS VS GRASP OPERATORS

### ICL G2+ & DME OPS (ALSO PART-TIME)

### SENIOR G3 JOB SET-UP/DATA CONTROLLER

### ICL SYSTEM 4 J 1800 OPS — North and South

### HONEYWELL OS 2000 OPERATORS

### HONEYWELL GCOS OPERATORS

### BURROUGHS 1700 OPERATORS

### DDE/PUNCH/VDU OPERATORS

## FORTHCOMING

### OS JCL WRITERS

### IBM DOS VS POWER OPERATORS

### ICL G2+ & DME OPS (ALSO PART-TIME)

### ICL 2960 VMEB OPERATORS

### ICL G3 OPERATORS

### HONEYWELL OS 2000 Ops and Senior Ops and Shift Leader for one-year contract. Top rates and bonus

### HONEYWELL GCOS OPERATORS

### UNIVAC 1100 & 9000 OPERATORS

We pay excellent rates (and expenses) to our Contractors

PHONE 01-439 6481 (24-hour answering service)

for more information or send the coupon below for immediate attention

**EFFECTIA GRAVIS**

NATIONAL HOUSE, 66 WARDOUR STREET, LONDON W1V 3HP

COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(A)62

## OPERATORS

(BLOCK CAPITALS PLEASE)  
Complete the coupon and return to the address below, for your next PERMANENT or CONTRACT job.

Name (in full) \_\_\_\_\_

Address (Permanent) \_\_\_\_\_

Telephone Home \_\_\_\_\_

Type of Transport \_\_\_\_\_

Current Position \_\_\_\_\_

Contract/ Permanent \_\_\_\_\_

Position Required \_\_\_\_\_

Contract/ Permanent \_\_\_\_\_

Notice Required/ Date Available (delete) \_\_\_\_\_

Areas Preferred: First Choice \_\_\_\_\_

Experience to date: (last position first) \_\_\_\_\_

From \_\_\_\_\_ To \_\_\_\_\_

Mth/Year \_\_\_\_\_ Mth/Year \_\_\_\_\_

Hardware \_\_\_\_\_ Operating Systems/ Software \_\_\_\_\_

Second Choice \_\_\_\_\_

Signature \_\_\_\_\_

**EFFECTIA GRAVIS**

NATIONAL HOUSE, 66 WARDOUR STREET, LONDON W1V 3HP, 01-439 6481 (24 hours)

REG. NO. DATE

OCT 17 1978

# ANALYSTS AND PROGRAMMERS

LOCAL INTERVIEWS FOR LOCAL JOBS.

## LEEDS

**Systems Analysts** c.£5500  
Major opportunity in a progressive company. These are ground floor appointments in a new installation and new systems under development will include on-line, real-time and distributed processing.

(C/78071)

**Programmers** from £5000  
COBOL programmers also required and positions and salary will depend on qualifications and experience of the successful candidates.

(C/78072)

## NEWCASTLE

**Senior Analysts** c.£6000  
Major industrial company wished to recruit additional senior systems analysts. Experience in a commercial installation is essential as is a good business background.

(C/78073)

**Principal Programmer** c.£6250  
Minimum of 7 years experience of COBOL and ASSEMBLER, Experience of all types of file handling, database and CICS. Previous supervisory experience leading more than one applications team an advantage.

(C/78074)

## SHEFFIELD

**Senior Systems Programmer** to £6500  
Progressive IBM installation needs Team Leader in its Software section. DOS, CICS, DBOMP, or DL/1 required.

(C/78069)

**Systems Programmer** c.£5000  
A young Systems Programmer is also required for a position in the support team. IBM experience essential although not in as much depth as for the senior position.

(C/78070)

Please write or telephone Ivor Norton in confidence to arrange your local interview.

THESE ARE SPECIFIC VACANCIES FOR WHICH WE HAVE BEEN RETAINED BY THE CLIENT COMPANIES.

## Ivor Norton Management Services Ltd

P.O. Box 63, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 66628.

## FORTRAN PROGRAMMERS

**West End** £3760 to £5900

If you are a programmer with 12 months' or more FORTRAN experience and can see little hope of career advancement in the near future, then perhaps you ought to consider a move. An opportunity has arisen for a competent and ambitious programmer to join a large manufacturing company and so gain valuable experience in Financial Modelling and Systems Analysis on either IBM or ICL mainframes (they have both).

If you also like the prospect of a Non-Contributory Pension, Season Ticket Loans, subsidised restaurant, and cheap company products, then telephone at once.

Reference PG 33/1

## OPERATIONS

### IBM & ICL

**IBM OPS SUPERVISOR** £6000  
N. London site. Some ICL exp useful. Suit Senior Shift Leader.  
**IBM SHIFT SUPERVISOR** £6000  
C. London. 4 years OS with good JCL. Excellent prospects.  
**IBM SHIFT LEADER** £6000  
C. London. DOS site. Minimum 3 years experience. Good perks.  
**IBM SENIOR OPERATORS** £5300  
C. London. 2 years DOS experience. 3 shifts. 5 days. Good prospects.  
**IBM OPERATORS** £4400  
Minimum 1 year OS experience for various C. London sites.  
**ICL SHIFT LEADER** £4900  
2 shifts only. Minimum 2 years experience on CII.  
**ICL OPERATORS** £4100  
Various sites. Need ICL operators with 6 months+ experience.

## REAL TIME PROGRAMMERS

**Central London** £4000 to £8000

One of this country's most respected software houses has a number of opportunities in their Real Time Systems Division based in Central London. Positions exist at all levels from Programmers & Analysts through to Consultants, Assemblers, or Fortran experience in any of the following areas: Message Switching, Production Control, Military Systems or Communications, gained on Minis or Micros, would be suitable. An ability to meet and communicate with clients, an outgoing personality and the willingness to pick up new machines and languages is essential. If you believe that you could comply with the above specifications and would like a rewarding position with an excellent salary and prospects, ring us immediately.

Reference PG 33/2

## BURROUGHS, NCR, UNIVAC, PDP, HONEYWELL

**BURROUGHS OPERATOR** £3500  
C. London site working DAYS ONLY. Any B1700 experience.  
**BURROUGHS OPERATOR** £4600  
W. London site working EVENINGS. Any B1700 experience.  
**BURROUGHS OPERATOR** £42000  
Any large Burroughs experience needed for Surrey site.  
**NCR JUNIOR OPERATOR** £3300  
8 months experience needed for City site. Usual banking perks.  
**UNIVAC OPERATOR** Up to £4500  
Minimum 18 months OS3 experience for large City based firm.  
**DEC OPERATOR** Up to £4200  
Company in C. London requires 4th PDP experience.  
**HONEYWELL OPERATOR** £10 to £4000  
GCOS experience required for large site located in N. London.

### DATA CONTROLLERS

We have many positions, both Junior & Senior, at salaries up to £3000.

## COBOL PROGRAMMERS

**West London** £3000 to £8000

A major manufacturing organisation wishes to recruit additional staff to assist in the implementation of new projects at their West London Computer Centres. They are interested in programmers with all levels of experience to work on a number of new systems which are in various stages of development. All programs are written in COBOL and experience on any major manufacturers' hardware will be considered. As specialist training will be given where necessary to successful candidates. The company, which has diverse interests throughout industry, offers excellent conditions of employment including free lunches and life assurance and the opportunity to develop beyond programming into analysis and systems work.

Reference JC 33/4

DataScene Recruitment Ltd  
Sceptre House  
169-173 Regent Street  
London W1R 7FB

Reference PG 33/2

1-800-1000 01-439 7871  
24 hour answer phone

## ASSISTANT DEVELOPMENT ENGINEER

Data Systems

Newcastle upon Tyne  
up to £6774

Based in the engineering Division at Regional H.Q., Killingworth, Newcastle upon Tyne.

The Assistant Development Engineer (Data Systems) will become the leader of a small team which is responsible for advising the Engineering Division on the application of computers especially for Grid Control and the communications and instrumentation section.

The team is responsible for the operation and controlling development of a number of IBM System 7 computers which are used for telemetry monitoring and controlling the VHF radio network. The successful applicant will also be responsible for liaison between the Engineering Division and the Region's Computer Services Department.

Applicants should have a degree in engineering, mathematics or computer sciences, and experience of real-time computer applications in the engineering industry.

Salary range £5712-£6774 inclusive of supplements pending pay award.

Application forms, quoting reference E004R, are obtainable from Personnel Division, Northern Gas, PO Box 1GB, Newcastle upon Tyne NE99 1GB, or telephone 885682. Closing date for applications: 25 August, 1978.

## NORTHERN GAS

Expanding Company would like to acquire an established Software House and/or Service Bureau. Preferably within the Home Counties.

Please submit brief history which will be kept strictly confidential to:

**W.V.B. Ltd.**  
1 Great James Street, London WC1N 3DT

**Operator/Office Admin.** for Honeywell L62. £1000 neg.

**Punch Operator** required. £3000 neg.

Tel: 01-402 9281, Ext. 48

**HOME COUNTIES**

£7000+

Handover exp. on any mainframe or mini computer

Leechfield Limited

(Computer Recruitment Consultants)

Bridge Buildings, Ladybridge Road, Chaddle Hulme

Cheshire SK8 5LL

061-486 0591 day or 061-950 6879 evenings/weekends

FREEPOST LONDON W4 3BR

CONTRACT PROGRAMMERS

Manchester Area £8-£10,000 p.a.

Six-month contracts available immediately or up to two months' start for ASSEMBLER/COBOL Programmers, HONEYWELL, TDS Programmers and PLAN Programmers.

We have many projects to follow and require persons with over three years' programming experience to join our highly successful freelance team.

Please contact:

LEE RICHFIELD LIMITED

(Computer Recruitment Consultants)

Bridge Buildings, Ladybridge Road, Chaddle Hulme

Cheshire SK8 5LL

061-486 0591 day or 061-950 6879 evenings/weekends

BRITISH AEROSPACE DYNAMICS

For details of these and many other posts please contact in the strictest confidence:

P. Bell

LUDBROOK MANAGEMENT SERVICES

Management Services

1 East Gates, LEICESTER.

Telephone Leicester (0533) 52314

## Computer Operator

£4,500 Herts.

Everest Double Glazing, a member of the RTZ Group, are manufacturers and distributors of high quality double glazing products with branches throughout Southern England.

Currently our DP Department is expanding its mainframe in IBM system 3 model 12 to model 15D and therefore an operator, with experience of model 15D and CCP, is required.

The successful man or woman will be able to operate the computer without supervision and decorate and distribute all output. Work will be on a rotating shift basis, e.g. 9.00 a.m. - 5.00 p.m. Monday to Friday, followed by 4.00 p.m. - 2.00 a.m. Monday to Thursday.

The starting salary of £4,500 includes shift allowance and will be reviewed after 6 months. An excellent range of company benefits is offered.

a member of  
the RTZ Group

Please write, with details of experience to  
Mr D. King, DP Manager, Everest Double  
Glazing Limited, Everest House, Cuffley,  
Herts.

## SIGN-UP TODAY!

and earn up to £8000 p.a. (£150 + p.w.)  
We have dozens of requirements for  
operators on contracts from 1 week  
to 1 year.

— overseas too!

CoOperators  
Member of the RTZ Group

ring Bill Hogg  
**01-836 8411**  
— for contract assignments

Urgent  
Hewlett 6000 GECOS  
Hewlett 0S 2000  
370/OS/VS/VM  
UNIVAC 9000  
OS/VS1 JCL  
HOLLAND

## BRITISH AEROSPACE DYNAMICS GROUP

## Systems Analysts

## AND A Computer Operator

are required to join a well established Data Processing Department at our Lostock factory.

The computer configuration consists of a 512K IBM 370/138 with 3270 on real time systems, 3790 key to Disc and 2790 data collection on line to a system 7.

Software used includes DOS/VS, CICS/VS, POWER/VS, D/BOMP, DL/1, VTAM and SPMOL.

Approximately five miles from the centre of Bolton, we enjoy the benefits of a big town with attractive countryside and Lakeland close at hand. Accommodation prices are well below the national average and we will assist with relocation costs where appropriate.

Applications are invited from both sexes and letters of application giving details of qualifications, experience and current salary should be sent to Mr. J. E. Gibbs, Personnel Officer, British Aerospace Dynamics Group, Hatfield/Lostock Division, Lostock, Bolton, Lancashire BL6 4BR.

BRITISH AEROSPACE DYNAMICS

JULY 1978

## IRISH RECRUITMENT FEATURE



Advertisers are reminded that the next Computer Weekly area feature will be published on August 24 and will highlight career opportunities in Ireland.

Space reservations should be made as soon as possible to:

Owen Kelly — Manchester — 061-872 4211  
Eddie Farrell — London — 01-261 8087

Copy Deadline: PM Friday before

## COMPUTER WEEKLY

THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

★ Why not consider moving to a more rural area—relaxed country atmosphere

### PROGRAMMERS ESSEX

Management services division of major British group with annual turnover of almost £1,000m seeks COBOL programmer with minimum 2 years IBM or ICL COBOL within a project team. Programmers will become involved in programs design, coding, testing, documentation and maintenance, as well as assistance in systems implementation. Co offers—  
 \* Comprehensive range of applications  
 \* Opportunity to move advanced technical projects and a variety of languages and machines  
 \* Paid overtime—flexi hours—subsidised restaurant amongst many of the excellent perks  
 \* RELOCATION expenses  
 \* Salary £5,500

REF 1624

**PROGRAMMER ESSEX**  
Leading clothing manufacturer seeks programmer with at least 18 months COBOL experience. The D.P. dept is fairly small at present but the company is growing very fast. The successful applicant will also act as Assistant to the Data Processing Manager. This is a superb opportunity for young ambitious person wishing to develop with a company. They retain BURROUGHS hardware but will consider any hardware experience. Occasional travel to their head office in London is required. If you want a CHALLENGE phone now.

Co offers—  
 \* Exciting new growth potential  
 \* Highly progressive organisation  
 \* Excellent career prospects  
 \* RELOCATION expenses  
 \* Salary £6,000 + COMPANY CAR

REF 1703

**SENIOR PROG LONDON**  
Our client an international company based in the City seeks Senior Programmer with at least 3 years COBOL experience. To work with a team of programmers which is principally engaged in the development of systems used to support the companies telecommunications activities overseas. They retain ICL 1903 under George III but will consider any COBOL experience.

Co offers—  
 \* Continued development with a well planned schedule  
 \* Good promotional prospects  
 \* Progressive organisation  
 \* Opportunity to learn new languages and get on to MINIS  
 \* Salary to £8,300

REF 1700

**MINI PROGRAMMER KENT**  
Our client is an International company based in a busy main town surrounded by beautiful countryside. They seek a programmer with 18 months' DEC PDP 11 and BASIC + experience. Their hardware is newly installed, offering new development in both manufacturing and financial areas.

Co offers—  
 \* A challenging position with opportunities in a variety of areas  
 \* Surrounded by picturesque scenery and where housing is very cheap  
 \* Above average terms and conditions including 4½ day week  
 \* Salary to £5,500

REF 1695

**Computing Services Association**

★ Take a step up the ladder—Learn new techniques—improve your prospects

### MINI PROGRAMMER CAMBRIDGESHIRE

Our client, a manufacturer of high precision instruments, situated in the beautiful rural surroundings of Cambridge. They seek a senior programmer to work on newly installed PDP II under RSMII and BASIC +. Ideal applicant will have at least 2 years' experience of BASIC or BASIC +. Company offers—  
 \* Continuous development of both commercial and financial applications  
 \* Opportunity to learn CICS and Database techniques  
 \* Promotion prospects within a progressive organisation  
 \* Excellent perks including STLS, staff restaurant  
 \* Salary £8,500c

REF 1478

REF 1680

### SYSTEM ANALYST LONDON

Our client a prestigious Merchant Bankers, are seeking a Systems Analyst who has either financial or insurance experience. They retain IBM 370 under OS/VS but will consider other hardware experience. Co offers—  
 \* Full banking benefits including subsidised mortgage  
 \* Excellent working environment  
 \* Job security with prestige concern  
 \* Salary £7,500

REF 1694

### SENIOR PROGRAMMER OXFORD

Our client a major manufacturer of construction materials throughout the UK, with turnover exceeding £200m running a modern computer centre and operating on ICL 1901T (upgrading shortly) they wish to appoint a Senior Programmer. Successful applicant will have comprehensive COBOL experience with PLAN and Filetab as an asset.  
 \* Working on own initiative with minimum of supervision  
 \* Opportunity to work in small, friendly dept.  
 \* Relaxed picturesque surroundings not too far from the beautiful city of Oxford. (Due to location applicants should have their own transport.)  
 \* RELOCATION expenses will be negotiable  
 \* Salary £6,500

REF 1695

REF 1698

### OPERATIONS SHIFT LEADER LONDON

Due to expansion within the operations department, our client, a large national organisation require a shift leader. They retain IBM 370 hardware under DOS running a 3-shift system. Company offers—  
 \* Wide range of interesting and new projects  
 \* Flexible hours  
 \* Excellent career prospects  
 \* Annual bonus  
 \* Salary £6,800 in SHIFT ALLOWANCE

REF 3062

REF 1698

For further details of the above positions and of the many others we have available in urban and rural areas—please ring our London office: 01-734 0152 / 3010.

## CONTRACT DIVISION OVERSEAS

IMDS DESIGNERS  
IBM OS/COBOL  
IBM DOS/MS COBOL  
ICL 1900/30  
POP/RSX IBM FORTRAN  
POP/RSX IBM AS400  
BURROUGHS 6700 COBOL  
ANALYST PROG MS COBOL  
IBM PL/I TSO  
POP/DOS/MS + RSTS/E

Phone now for immediate and future contracts  
Ring Christine Kay/Dave Hayton, Tel. No: 01-734 0152 (24 hours)

**KNIGHT PROGRAMMING SUPPORT LIMITED**  
27 NOEL STREET, LONDON W1 TELEPHONE: 01-734 0152/8 (24 HOURS)  
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

★ Increase your salary—consider the perks!

### MINI PROGRAMMERS LONDON

Prestige company operating on a global scale are recruiting persons with 1-3 years experience on ANY MINI ASSEMBLER to work in their new modern City offices. Having large DEC PDP 11 equipment and expanding at a rapid rate they have a wide range of ongoing projects both in hardware and software areas.  
 \* Extensive training in up to date technology  
 \* Excellent career opportunities  
 \* Flexi hours  
 \* Beautiful rural surroundings with reasonable house prices  
 \* RELOCATION expenses  
 \* Salary £8,500c

REF 1478

REF 1680

### ANALYST PROG HERTS

One of the country's leading retail organisations seeks analyst programmers to work at Team Leader level on the development of new batch, interactive and distributed systems. Company currently need programmers with minimum 18 months COBOL, ASSEMBLER or RPGIII exp. to work as part of project group.

Company offers—  
 \* Opportunity to go into analysis, with good scope  
 \* Fantastic working conditions, including large sports and social club

\* Paid overtime, flexi-time, insurance cover  
 \* Subsidised staff restaurant  
 \* Salary to £8,500

REF 1872

REF 1655

### ANALYST PROGRAMMER S.E. LONDON

Our client, a major British insurance company in South East London, seeks an analyst programmer with at least 12 months analysis experience. They retain ICL 2960 using COBOL although they will consider ANY HARDWARE experience. Co offers—  
 \* Excellent prospects for career path  
 \* Scope in a variety of areas  
 \* Good perks which include 2 bonus's a year  
 \* Salary £8,000

REF 1858

REF 1695

### MINI PROGRAMMER HANTS

Our client is a major British company with business interests in many areas. They seek programmers with at least 18 months DEC PDP 11 and BASIC + experience. This hardware is newly installed and thus offers a chance to become involved in the development from the beginning. Co offers—  
 \* Wide range of interesting and new projects  
 \* FREE lunches and a season ticket loan  
 \* FREE life assurance  
 \* 20% staff discount  
 \* Salary £6,800 in SHIFT ALLOWANCE

REF 1688

REF 1705

### DATA PROCESSING MANAGER MIDDX

Our client a major British company with their head office in Middlesex has a vacancy for a D.P.M. to be responsible for all aspects of the department including programming and analysis. Ideal applicant will have strong personality, confidence, management capabilities and be able to liaise at all levels. Company retains DEC PDP hardware and seeks person with a good programming background. This company offers a fantastic opportunity for young person to progress into management.

Co offers:  
 \* Excellent working conditions  
 \* Security in a growing organisation  
 \* Excellent fringe benefits  
 \* Salary £7,000 + COMPANY CAR

REF 1705

REF 1706

### MINI PROGRAMMER MIDDX

Our client is a major British company with business interests in many areas. They seek programmers with at least 18 months DEC PDP 11 and BASIC + experience. This hardware is newly installed and thus offers a chance to become involved in the development from the beginning.

Co offers—  
 \* Wide range of interesting and new projects  
 \* FREE lunches and a season ticket loan  
 \* FREE life assurance  
 \* 20% staff discount  
 \* Salary £6,800 in SHIFT ALLOWANCE

REF 1688

REF 1705

### FOR THE BEST JOBS IN THE SCIENTIFIC AND TECHNICAL COMPUTING FIELD—CONTACT US NOW

PER regularly organises the Engineering, Scientific and Technical industry

and now deal with over 400 companies throughout the U.K. There is

huge demand from these companies for experienced and Graduate

vacancies with FORTRAN experience. Jobs from £3,500 + £8,000

plus + £100 per week for a free list of vacancies

Initial appointments: 29 Windmill Street, London, W1  
 Tel: 01-438 5851 (day) — 01-438 5850 (evening)

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**MAI**

manufacturers of the

# BASIC/FOUR

real-time, disc-based, mini-computers are seeking to recruit

## SALES EXECUTIVES

MAI, via their subsidiary the Basic/Four Corporation, are among the market leaders in the manufacture and supply of small business systems. We have over 5000 systems installed worldwide.

A survey of users of disc-based, real-time mini-computers conducted by Datapro placed Basic/Four unequivocally ahead of the field.

In line with our European expansion we are seeking to recruit Executive Salesmen.

The people we are looking for will be well-versed in commercial applications and have at least 2 years' experience in selling bureau, VRC's or small business systems.

Call:

**Richard Marler**  
**MAI United Kingdom Limited**  
**43 The Vale, London W3 7RR**  
**Tel: 01-749 7331**

Job 11 in file

The rewards for the right candidates are:

- 1 Generous basic salary
- 2 Quota earnings in excess of £13,000
- 3 No upper limit on earnings
- 4 Company Car
- 5 Big Company benefits, including BUPA, etc.

You would also have, and be encouraged to exercise, the independence that we enjoy as an autonomous subsidiary of our international parent company.

Join the team selling the most successful small business systems in the world.

## Software Professionals

### ... build an international career with us

Part of Corning Glass Works, a large US multi-national corporation, we are the European Medical Division involved in the development, manufacture and marketing of clinical instruments and diagnostic systems.

#### Technical Software Supervisor

This is a challenging post and will ideally suit a self-motivated professional with a background in software/communications. You should have at least two years programming experience preferably on IBM software for IBM System 3 or 370 machines.

#### Analyst Programmer

You should have at least 2 years experience, including designing, specifying and writing programs for IBM equipment. Experience of CORAL or RPG2 is essential. In addition to the challenge of systems design you will have the opportunity to undertake analysis training.

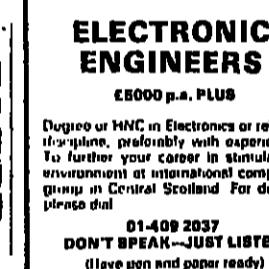
Equipment used for both the above opportunities is IBM System 3/150 (192K), based at Halstead Essex.

An attractive salary and benefits package will be offered in addition to opportunities for advancement with our parent company in the UK, Europe and the USA.

For further details and an application form, please contact Brian Murray, Personnel Manager, Corning Medical, Corning Limited, Northern Road, Chilton Industrial Estate, Sudbury, Suffolk CO10 6XD. Tel: Sudbury (0787) 76481.



**CORNING**



**JBA**

### Junior Consultants

Berks/USA/Europe Start c. £7,000 + BUPA

Opportunities have arisen in the European Systems team of this major American company for Analysts or Analyst/Programmers to join as Project Consultants. They will provide support and advice on commercial projects of all kinds to installations throughout the UK and Europe, and applicants should therefore have a good grounding in commercial applications, preferably with a strong IBM bias.

These vacancies have occurred through internal promotions to more senior levels indicating that career prospects are definitely good for able candidates. An ideal opportunity to gain experience of Project Management at Consultancy level. Travel to the USA and Europe, supported by generous tax-free allowances, will play a major part of the job. Contact: Andy Wright

### Systems Analysts

London W1 £5,500-£7,500

A major British engineering and construction company has retained JBA to recruit Systems Analysts to strengthen their financial systems team. All applicants must have worked on financial systems, and for the Senior positions, a minimum of four years relevant experience is expected. The less senior vacancies would commence at salary levels of c. £6,000; Analyst/Programmers looking for a move into full systems analysis should have a minimum of three years D.P. experience.

Good salaries and working conditions, plus the attraction of being part of a dynamic environment. Contact: Andy Wright

### Process Control

Bracknell up to £8,000

A small development group has been established in Bracknell by an international engineering organisation to continue their expansion of the industrial systems market. They have immediate opportunities for mini-computer programmers and specialists to work at all levels on these projects. Applicants must have at least two years experience in industrial or process control applications using mini-computers. A sound background of FORTRAN, CORAL, RTL2 or Assembler is essential. Excellent salaries, relocation expenses and the opportunity for commissioning work in various parts of the world. Contact: Andy Wright

### HOLLAND CAD/CAM Consultant

Salary & terms negotiable

This senior position will suit a specialist in computer aided design/management wishing to apply his or her experience and knowledge in a consultancy role. The particular skills required are in the areas of interactive graphics applications, numerical control system design, part production systems and design analysis. Dealing with potential customers and assisting the sales and support teams will be the essential part of the job, as well as advising the programming and design teams.

The successful candidate will have a proven track record in CAD/CAM type development and sales, be a highly personable and presentable individual with a willingness to travel and deal with people at all levels. European language ability an obvious bonus.

Attractive senior staff position offering tremendous scope for creativity, job satisfaction and career development. Contact: Mike Cremer

### HOLLAND Programming Team

up to £12,500

We have been retained to recruit a team of IBM370 OS/VSI experienced programmers with a very sound COBOL background and complete familiarity with JCL. The group will comprise a team leader, three junior analysts or Senior programmers, and several junior programmers (with at least 18 months experience).

The project applications area will include factory systems, material management, stock control, purchasing and work in progress. Ideal commencement date will be early October and interviews will be held during August in the UK and Holland.

Lovely opportunity to experience living and working in Holland whilst earning good salaries. Contact: Mike Cremer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES, International Personnel Consultants**

16 Maddox Street, London W1. Tel: 01-491 4478

**ata** Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to Industry and Commerce since 1963

## HARDWARE APPLICATIONS ENGINEERS

Salary: £1,100 plus CO. CAR + EXPENSES  
MANCHESTER AND HOME COUNTIES

Our client, a major manufacturer of international repute require for the SPECIAL SYSTEMS division experienced Applications Engineers.

The division is responsible for the design of non-standard systems and devices in application areas, such as process control, graphics and telecommunications. This may involve small production rooms of specialised hardware.

The duties of the engineers are:—

- (a) to define the system in conjunction with the clients.
- (b) liaise with the software and design engineering departments.
- (c) to correlate the data and compile the costings.
- (d) prepare customer proposal with detailed product and software descriptions, and
- (e) co-ordinate delivery, installation, and maintain customer contact thereafter.

Applicants ideally should be graduates in electronics engineering or computer science, have in-depth experience of one or more of the following: systems design, hardware design, process control, telecommunications, contract negotiation and project management. Relocation expenses include all legal fees, estate agent fees, removal costs and subsistence allowances.

For further information telephone Ian Baker on 0272 211035 or contact your nearest ATA office.

ATA COMPUTER RECRUITMENT

LONDON (01) 637 0781 MANCHESTER (061) 832 5856 BIRMINGHAM (021) 643 1994  
BRISTOL (0272) 211035 EDINBURGH (031) 226 5381 CRAWLEY (0293) 514071

# A CHANGE IS AS GOOD AS A REST

## PROGRAMMER—COBOL

c£4,500 + benefits

City

Our client requires young COBOL programmers with a minimum of 18 months' programming experience, preferably in the financial sector. Experience on Honeywell equipment or previous use of OS 2000 would be an advantage but isn't necessary. The company offer good fringe benefits for example cheap mortgages, bonus schemes, free lunches and interest free commuting loans. To work with small team on many varied and interesting projects with flexitime hours. Enquire now.

AOC 1057

## PROGRAMMER—COBOL

c£4,500

London SE1

COBOL programmers required with a minimum of 12 months experience on commercial systems. Successful applicants will be involved in a fast expanding department so promotional prospects are good. The company has an ICL 1901T using EXEC but no previous ICL experience is necessary. For more details phone now.

AOC 1037

## PROGRAMMERS

£4,000 to £6,500

Colchester

Have you had 18 months programming experience in ASSEMBLER — PL1 or related languages and would like to work with Database applications plus gain experience with mini computers? Our client is offering excellent opportunity for people to gain in depth experience of new software techniques and help develop and maintain new computer systems. Applicants should have an IBM programming background. Any experience of TP systems or IBM minis would be an advantage, these requirements assist starting salary but are not completely necessary. For more details enquire now.

AOC 1126

## PROGRAMMERS — BASIC/ASSEMBLER

£neg good

Dagenham

Our client requires programmers with not less than 2 years' BASIC or ASSEMBLER programming. Applicants should be a minimum of 23 years of age and have experience of IBM DOS systems. Successful applicants should expect an increase of their current salary plus benefit schemes from the start employment. More details available, enquire and quote reference number.

AOC 1008

JULY 11, 1978

**Gryphon Computer Recruitment**  
Essex House Cherrydown Basildon Essex

Contact Chris or Olivia on 0268 282155



GRYPHON

## PROGRAMMERS

c£6,000 + benefits

London SW1

PLAN - FILETAB - COBOL, if you have 2-3 years experience in one or more of the aforementioned languages and would like to work in a small installation on applications with a difference then our clients would be very interested in seeing you. The work location is easily accessible to commuters and the company give interest free season ticket loans to assist. This is a chance to get involved in a small computer department where the work is a lot more interesting and challenging than the normal commercial applications. Any previous experience with George 2 would be definite advantage. The company offer luncheon vouchers and free membership of BUPA. For more details enquire quoting reference number.

AOC 1092

## PROGRAMMER—COBOL

c£4,800 + benefits

Surrey

Required to work in an IBM environment under DOS/VS with POWER. Applicants should have a minimum of 18 months' COBOL programming experience on commercial systems, any knowledge of ASSEMBLER would be an advantage but not essential. The company is currently involved in major redesign and development of all current systems, especially their on-line systems. If you require good job prospects and interesting work also involvement with on-line systems then this position would be of definite interest.

AOC 1045

## PROGRAMMERS — COBOL-PLAN

c£4,500+

Reigate

How would you like to be involved in the setting up of a new installation? Being one of the first-in any new installation is good news for the right people. If job satisfaction is what you are looking for in your next assignment then look no further. Our client is offering relocation assistance to successful applicants who have a minimum of 18 months solid COBOL or PLAN programming on ICL machines. The company specializes in integrated accounts systems using their own specially written systems for their many clients; each system being written for individual clients so there is no modification work to existing or bought packages! This surely must be an opportunity not to be missed, enquire now for more details, quoting reference number.

OC 1141

## ANALYST

c£6,000 p.a.

London SW1

Our client is a specialist organisation connected with the engineering industry. They have asked us to find an analyst with 2 years' commercial systems work to become involved with financial systems of a complex and varied nature. The work is interesting and offers opportunity to develop your analysis skills in a stimulating environment.

AOC 1092

## ANALYST

c£6,000 p.a. + benefits

Oxford

We require someone who has designed and implemented at least one major commercial system on IBM or DEC equipment. In addition we need practical experience of PLI programming. The job involves developing new, and extending existing, in-house systems and packages. Information-retrieval systems are currently being developed. Location is on the outskirts of Oxford, a pleasant rural area, and fringe benefits include a subsidised restaurant, free life assurance and flexitime working.

AOC 1108

## SYSTEMS DESIGNERS

c£6,500

Essex

Our client requires systems designers to work on the analysis of new on-line systems. Applicants must have proven experience and have a practical programming experience. A knowledge of on-line systems would be useful in developing the company's expanding remote terminal facilities.

AOC 2140

## CHIEF PROGRAMMER (PL1)

To £7,000 + benefits

Essex

Applicants should have a minimum of 4 years solid PL1 programming experience on financial and commercial systems. To take supervision of a team of programmers, some team leadership experience is necessary and a knowledge of on-line systems, preferably on IBM equipment. This position offers a rare opportunity to a senior person to realise his management capabilities whilst working on a variety of interesting new developments.

AOC 1140

## ANALYST

Kent

Four years experience of programming and design of commercial systems qualifies you for this position. The company is an established ICL user with a sophisticated 1900 installation, using driver. Knowledge of on-line systems and experience in insurance or banking would be advantageous. The requirement is for a senior person, who in addition to the normal analyst duties, is capable of arranging client meetings and taking a large measure of responsibility for current projects.

AOC 1094

## SYSTEMS PROGRAMMERS

c£4200

British Aerospace is looking for Systems Programmers to assist with Software Development on two PDP11/45 Processors situated in their flight Development Department.

The job entails analysis of Data, recorded in flight, from sophisticated Military and Civil aircraft. Applicants, of either sex, are expected to be educated to degree standard and to have at least two years' experience in DEC Assembler Language.

Please write, giving brief personal and career information to:

D. Stopford, Personnel Manager,  
British Aerospace Aircraft Group,  
Manchester Division, Woodford,  
Stockport, Cheshire SK7 1QR.

BRITISH AEROSPACE

## A 2M byte ICL 2970 running under the VME/B operating system has recently been installed at the Authority's Computer Services Section in central Bradford and, due to internal promotions and new systems developments, the following staff are now required:

### PROGRAMMERS (COMMERCIAL)

REF: RIV450

RADS-2402 p.m.

Applicants, male and female, should be commercial programmers with at least two years' practical experience in writing COBOL programs. Previous 2900 experience is not essential as training will be available where necessary.

### PROGRAMMER (SOFTWARE)

REF: RIV452

RADS-2402 p.m.

Applicants, male and female, should have at least two years' COBOL and/or FORTRAN programming experience and although operating system support experience would be an advantage, consideration will be given to applications programmers wishing to move into the systems programming field. Training in 2900 and VME/B will be provided as necessary. Relocation expenses and disturbance allowances will be paid in approved cases.

For further details and application forms please telephone Leeds 446201 Ext. 278, quoting the appropriate reference number.

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Barrow Wrightson House, Cawood Grove  
Leeds LS12 4AS, Tel: 0532 522444  
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Informatix 24 Gray's Inn Road London WC1X 8HR Telex 299538 HAVEN G  
RECRUITMENT CONSULTANTS



POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
SYSTEMS ANALYSTS	c £6,000	INSURANCE	ESSEX	IBM OS	Urgently required — analysis to provide support services for a TP network. 1 yr. experience + DP. Excellent opportunities for the right people.	33/1
ENGINEERING/ SCIENTIFIC/ ANALYST/ PROGRAMMER	A1 NEG	BUREAU CONSULTANCY	HOLLAND	MURIS	1 yr. + contract available to scientific/technical people with 3 yrs. experience in an engineering/scientific environment to work on a wide range of interesting projects.	33/2
ANALYST/ PROGRAMMER	£6,200	BUREAU	LONDON	IBM OS	Professional BP personnel with knowledge of COBOL and the ability to work on complex systems required to join this established organisation. Graduates considered.	33/3
RPG II PROGRAMMER	c £5,500+	MANUFACTURING CONSULTANCY	LONDON SURREY	IBM sys 3 sys 34	Programmers with 18 months + RPG II experience required to convert/develop a wide variety of commercial applications in a progressive organisation.	33/4
SYSTEMS ANALYSTS	To £8,000	CHEMICAL INDUSTRY	W. LONDON	ANY	First class career opportunities for analysts with 6 months + experience to develop commercial applications in a D.P./TP environment.	33/5
SYSTEMS PROGRAMMERS	c £5,000 + Bonus	SURFACE COATINGS	BERKS	ICL	Excellent openings for COBOL programmers with 2+ yrs. experience and knowledge of George/2900 ICL work in an on-line, technical support environment.	33/6
PL/I PROGRAMMER	To £8,000 +	SOFTWARE HOUSE	LONDON	IBM	PL/I Programmers with 18 months + experience urgently required for a wide variety of applications within this rapidly expanding organisation. Excellent career prospects.	33/7
ANALYST/ PROGRAMMER	To £8,000 +	MANUFACTURING	LONDON & MIDLANDS NORTH	VME + MURIS	Analyst/Programmer with 2 yrs. + experience and some COBOL or Assembler to work on a variety of systems using minis and telecommunications.	33/8
SYSTEMS ANALYSTS	To £8,000	FOOD INDUSTRY	SURREY	IBM OS	Analyst with 1 yr. + experience or depth programming experience required to work in this well-established company on data base applications. Promotion opportunities are excellent.	33/9
COBOL PROGRAMMERS/ ANALYST/ PROGRAMMERS	To £8,000 +	SOFTWARE HOUSE/ BUREAU	LONDON E.C.	BURBOURNS	Programmers and Analyst/Programmers with 3 yrs. experience urgently required to work on interesting commercial applications in this stimulating environment.	33/10
TECHNICAL/ SCIENTIFIC PROGRAMMER	To £7,000 +	TECHNICAL CONSULTANCY	LONDON S.E.	MURIS/ MURIS	Varied and exciting development projects available for scientific/technical programmers with 2 yrs. + Assembler/Fortran/COBOL experience.	33/11
SOFTWARE PROGRAMMERS	To £8,000	ELECTRONICS INDUSTRY	E.W. HERTS	ANY	Hard opportunity for the ambitious programmer working on the design, planning, implementation and product testing of a wide range of advanced products.	33/12
SYSTEMS PROGRAMMERS	c £8,500 +	PETROCHEM	LONDON W.I. + TRAVEL	MURIS	Two years + experience in assembly language coding and basic programming required. The job involves providing hardware and software support services to remote locations.	33/13
SENIOR ANALYSTS	A1 NEG	CONSUMER PRODUCTS	M.W. LONDON + TRAVEL	IBM/POP	Analysts with 4 yrs. + experience and a degree urgently required to develop interesting commercial projects based on a European network.	33/14
CUSTOMER SUPPORT ANALYSTS	To £8,000 + car allow.	MANUFACTURER	E.O.	SMALL BUSINESS M/C'S	Excellent opportunities for analysts with commercial experience to develop/install systems for clients. Knowledge of RPG II an advantage.	33/15
DESIGNERS/ PROGRAMMERS	To £8,000	CHEMICAL COMPANY	MURIS	IBM	Excellent opportunity for Analyst/Programmer with a COBOL background some supervisory experience to work in a DB/TP environment. Excellent career prospects.	33/16
ANALYST	c £8,000	SOFTWARE HOUSE	LONDON W.I.	ANY	Excellent opportunities for BP professionals with experience of DB/TP, GRAPHICS, or MURIS or INFORMATION RETRIEVAL to work in a stimulating environment.	33/17
PROGRAMMERS & ANALYSTS	To £8,000 +	DISTRIBUTIVE TRADES	SUSSEX	IBM	IBM COBOL Programmers with 2 yrs. + experience required to work on DB/TP applications in a rapidly expanding organisation.	33/18

## NETHERLANDS

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Come and talk to us if you have ambition and you want career scope. Contact Barry Whitesman on

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## PROGRAMMERS

move into

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CHIEF FINANCE OFFICER DEPARTMENT  
COMPUTER SECTION

## ANALYST/PROGRAMMER

Grade APS/6, £2732-£2973

This post offers a challenging and rewarding opportunity to participate in the development of a new ICL 2004 installation due to be commissioned in the autumn.

An applicant would have a minimum of two years' programming experience in Cobol and RPG2 with some systems analysis work. A knowledge of ICL 2004, JCL and COBOL would be an added bonus.

The above post is based in Widnes and a system of mobile working arrangements will be made available, in an appropriate case.

Applications in writing, giving full details of age, qualifications, experience together with full names and address, should be forwarded to the Head of Personnel and Management Services, Halifax Borough Council, Municipal Building, King Street, Halifax, West Yorkshire, HX1 1PF. Closing date: 25th August, 1978.

R. TURTON, Chief Executive

## OPERATORS

### TOTAL EARNINGS

TO £4,500+

Experienced operators are required by a Stockbroking firm with an installation at Chingford, London, E.4. The hardware involves an IBM 370/125 using DOS/POWER/VIS with both local and remote teleprocessing facilities.

Contact: J. Heskovic 01-524 1925  
Laing & Cruickshank  
15 Hall Lane  
Chingford  
London, E.4

**Anglian Water Authority**

## MIDDLEWARE MANAGER

£9,645-£10,371  
(including supplement of £312)  
Ref H3D004

The Authority is implementing a regional computer service based on the use of database and data communications techniques. A network of high-speed lines connects the Authority's 19 divisions to the Honeywell dual 66/10 installed at the Computer Centre in Huntingdon.

A Manager is required to head up the Middleware group within the Computer Services Department. This Group is responsible for:

- database administration
- data communications
- technical support
- installation planning

The successful applicant will have a strong technical bias and will have spent at least ten years in data processing, including first-hand experience of implementing database and data communications systems.

The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you are interested or want to know more about these opportunities, why not call Jenny Spencer at Huntingdon (0480) 58181 Ext. 370 for information and an application form.

The closing date for application is 1st September, 1978, and should be sent to:

**ANGLIAN WATER AUTHORITY**  
Brook House, Ouse Walk  
Huntingdon, Cambs.

## Science Research Council ROYAL GREENWICH OBSERVATORY PROGRAMMER

There is a vacancy for a Scientific Officer in the Northern Hemisphere Observatory Procurement Team at the RGO. The successful applicant will be expected to take up duty at Herstmonceux and will be required to make frequent visits to the NHO site on the island of La Palma, Canary Islands which is approximately 8000ft. above sea level. The vacancy is permanent and pensionable.

### DUTIES

- In the RGO as a member of the NHO Project Team, to work in the NHO Computer Department on providing software to collect and analyse data from astronomical detectors using computers; including liaison with electronics engineers and other members of the NHO Division.
- At the site to commission complete systems, to instruct visitors and staff where necessary and to assist in fault finding.

### QUALIFICATIONS AND EXPERIENCE

Applicants should preferably have a good Honours degree with significant computer systems content, or have an equivalent standard of knowledge, training or experience. Experience of Fortran is desirable but training will be given if necessary. A good background in Mathematics would be an advantage.

**SALARY** scale £2,839-£4,415. Starting salary according to qualifications and experience.

**APPLICATION** forms and further information can be obtained from Mr. N. Jones, Royal Greenwich Observatory, Herstmonceux Castle, Herstmonceux, East Sussex BN27 1RP; telephone Herstmonceux (032-181) 3171 Ext. 206 and should be returned not later than 15 September 1978.

For further details of this position, contact:

## Sutton, Surrey

The Crown Agents operate as financial, professional and commercial agents for about a hundred foreign governments and many more overseas public authorities and international organisations.

The Computer Division is located at Sutton in Surrey and a Honeywell Level 66/05 has recently been delivered to replace the H 1250 and H 1015 already installed.

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Up to £6,250

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MH/721/CD

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MH/722/CD

For further details and application form please telephone Miss Horne (01) 222 7730 ext. 3362, or write, quoting the appropriate reference

## Crown Agents

The Crown Agents for Overseas Governments and Administrations, Recruitment Division,

4 Millbank, London SW1P 3JQ.

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The successful applicant will supervise and schedule programming within the department and be responsible for continuing the programming standards and disciplines. Applicants should have a sound educational background, experience of over four years in programming and a detailed knowledge of NEAT/3 or MUMPS. A salary of up to £7,000 p.a., with assistance or relocation, if applicable, is being offered.

For further details of this position, contact:

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Anglesey Road, Burton-on-Trent, Staffs  
Tel: 66344

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The remuneration package will include a starting salary of £6000-£7000 depending upon experience, commission potential in excess of 25% of salary and company car.

Please write, giving career résumé, to:  
**Max Mahanke, General Manager**  
**COMTEN (Performance Systems) U.K. Ltd.**  
**23/24 Great James Street, London WC1N 3ES**

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## SCIENTIFIC PROGRAMMERS COMPUTER OPERATORS

Vacancies exist within our data processing division for Scientific Programmers and Computer Operators with some experience and an interest in

## OIL EXPLORATION

Experience in Seismic Processing and/or Mini Computers a definite advantage. Our offices are in Swanley, Kent, adjacent to the Swanley main-line station which is 25 minutes from Victoria.

**PROGRAMMERS.** Minimum qualifications are either a science-based degree or good "A" levels in Maths. or Physics; combined with some previous FORTRAN programming experience. Salary negotiable up to £4536 per annum according to experience.

**OPERATORS.** Candidates, though based in Swanley, will be required to work at an installation in London on a semi-permanent basis. Salary negotiable from minimum £2943 plus 20% of basic salary as shift allowance. Shift systems vary according to location but cover a 7-day/24-hour operation.

To be fair, Forsyth does give students some guidelines to be followed when portability is required, but these occur almost as an afterthought. In the last chapter and occupy less than half a page.

Both books more or less accomplish the aims of their respective authors. For my money, Alcock's text is the one more worth while having, and I cannot help thinking students' money will be better spent on it as well.

**CORNELIA BOLDYREFF**

**Puzzle answer**

## THE SALES BIT

## Finding where the buck stops

THE salesman can't always get it right. There is bound to be a situation somewhere along the line when, despite taking all the basic selling precautions, he suddenly discovers that the person he believed to be the decision maker has to go to some other source for final approval. This might involve a parent company board, a select committee, a direct superior or even a union.

More bold questions need to be asked. "When will the decision be made? How many people are on the board?" and when he knows the relevant facts: "Right, I'll prepare copies of our proposal for each of them and make sure they are delivered right away".

Perhaps, the third party will ask the salesman not to take the trouble. "It's no trouble", he should reply and then change the subject.

A covering letter should accompany each individual copy, perhaps indicating the date of the appropriate board meeting, and certainly referring to the "benefits" section.

This is essentially an unsatisfactory sales situation, but one where handing over a bunch of technical leaflets for onward transmission will not suffice. What makes it even more unsatisfactory is that it would never have occurred if the salesman had got his pre-approach analysis right or even asked the most important question of the first sales call: "Who makes the decisions around here?"

**TRADER**

## BOOK REVIEW

## Reading for Basic understanding

Illustrating Basic, by D. Alcock, £1.99. Cambridge University Press. The Basic Idea, by R. Forsyth, £1.95. Chapman and Hall.

ALTHOUGH both of these introductory books are written for students without any prior knowledge of computing, the approaches they follow are diametrically opposed.

While both authors acknowledge the lack of standardisation in Basic, Alcock accordingly treats the "need for portability as an axiom" and describes the language so that programs may be written without dependence on any particular version of Basic.

Forsyth adopts the policy of sticking to one representative implementation of Basic, namely Digital Equipment's. This latter approach severely limits the utility of the book.

To be fair, Forsyth does give students some guidelines to be followed when portability is required, but these occur almost as an afterthought. In the last chapter and occupy less than half a page.

On the other hand, some students may find Alcock confusing in that he often enumerates several possibilities in describing

THE formula is: Constant =  $\frac{1}{4}(n^2 + n)$ , so the constant for a 10 x 16 square is 256.

# A move to Southampton offers Computer Staff more than just a change of address.

**Southampton City — Right at the Centre of Things**  
— Ideally situated close to South Coast Resorts. Easy access to the New Forest and the West Country. Superb sporting and leisure facilities. A fine shopping centre. Just a few of the benefits a move to Southampton could bring Computer People who want more out of life than just job satisfaction.

**Southampton City Council has a number of vacancies in its Computer Division for suitably skilled staff. Employment benefits include —**

- Subsidised Canteen ● Staff Social Club ● Job Security... and dependent upon circumstances

£500 removal and resettlement allowance  
£10 per week lodgings expenses (up to six months)

Temporary housing accommodation.

Immediate vacancies within the Division include

## SYSTEMS ANALYST / PROGRAMMERS

Workload in the Division has created an urgent need for people with varying degrees of practical experience of DOS/VIS and who have a knowledge of COBOL. Preference will be given to those with formal qualification. Salaries are negotiable up to £5,073 p.a. according to experience. Working hours are flexible.

## COMPUTER OPERATOR

An operator experienced in the operation of the IBM 370 using DOS/VIS is required. The successful person will join a skilled team and should be prepared to work alternative shifts over a five-day week with overtime working to meet peak loads. Salary up to £3,651 p.a. plus shift allowance of 14%.

Our hardware comprises an IBM 370/125/2 with 3340/44 Disc System and mag. tape; a Burroughs 880 Mini for cash receipting and a Redifon Seecheck System for Data Entry.

For further details and application form contact the City Treasurer, Civic Centre, Southampton SO9 4XD. Tel: Southampton 23855, Ext. 498.

(Closing date for applications is 30th August.)

## Southampton City

Job 4 in 11A

## ANALYST / PROGRAMMER FOR DP AUDIT

Between £5133-£6012

The DP Audit Section of Eastern Gas at Enfield require an Analyst/Programmer who will be involved in the independent appraisal of the Region's computer based systems.

Reporting to the Assistant Audit Manager (DP), your work will involve the writing of TABN/FTLs and COBOL programs as an aid to the review of the Region's systems, and you will be expected to liaise both with Management Services and the other Audit functions with regard to controls over systems and the computer hardware/software. The ability to communicate with all levels of management is therefore of utmost importance.

The installation currently comprises three ICL 1800 mainframes which are scheduled for replacement by due 1972/3. This conversion is being closely monitored by DP Audit and is an example of the wide range of activities undertaken by the section.

The salary range will be £5133-£6012 according to your experience.

For further details of this excellent career opportunity in a major Region of today's go-ahead energy industry, please telephone or write for an application form to: Senior Recruitment Officer, Eastern Gas, Star House, Mutton Lane, Potters Bar, Herts EN6 2PD. Telephone Potters Bar 5115 ext. 602.

EASTERN GAS

## Computer Operations

KING'S LYNN £4500+

Dow Chemical is one of the world's leading chemical manufacturers with an exceptional record for growth and profitability. The Computer Services Group of the U.K. Company is located at King's Lynn together with a number of other major junctions.

We are looking for a computer professional to assume responsibility for our computer and data entry operations. We have an IBM System 3 model 12 for batch applications with remote job entry to a mainframe in Switzerland. The equipment is primarily operated during normal office hours. As part of our development plans for interactive applications, we will be installing a PDP 11/70 with VDU terminals at various locations in the U.K. This and other developments will provide a real career opportunity for someone with at least three years' experience of computer operations, wishing to get involved in the assessment of our long term application requirements. The successful candidate will be expected to work with the minimum of supervision in a progressive informal working environment.

The starting salary will be around £4500 but could be more for an exceptional candidate. We offer a range of fringe benefits including pension, share purchase and BUPA schemes and generous relocation expenses where applicable.

If interested, then telephone:

Alan Popham, Personnel Manager  
Dow Chemical Company Ltd.  
King's Lynn, Norfolk  
Telephone 81251 for an application form

DOW

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### WESTERN HOME COUNTIES

Our client is a member of a multi-national corporation and is engaged in the development of communications systems for a marketing of these systems in the UK and overseas in both Defence and Commercial markets.

Applicants should have experience in one or more of the following areas:

- UK Sales of integrated equipment multiplexers VDUs or computer systems
- Defence or overseas marketing of communications products
- Systems engineering in message switching or related fields

In-house training will be given where appropriate. Company benefits are excellent and include a company car and generous relocation assistance where appropriate. Please write in strict confidence quoting ref DT/248 to Brian Withers.

**GRS**

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or Tel 01-723 5334

## Wrangler

### SYSTEMS ANALYST/PROGRAMMER

Wrangler, one of the world's leading manufacturers of leisure wear, want to offer an interesting role to an enthusiastic professional who has at least 1-2 years' systems and programming experience in a commercial environment. You must have a knowledge of Cobol or RPG and any experience of on-line systems could be a possible advantage.

You will join a small EDP team at our Head Office and Distribution Centre in Calverton and have the opportunity to become very involved in the activities of the site. The Company has an IBM System 3 and knowledge of this hardware would be useful. Men or women interested in this position should telephone or write for an application form to:

Mr. Alan J. Oakham, Personnel Manager  
BLUE BELL APPAREL LIMITED  
Calverton, Nottingham  
Tel: Woodborough 3088

### Lothian Health Board

A Great Community Service

### SENIOR SYSTEMS DESIGNER

Scale 14 - (£25,537-£6,715 per annum)

A vacancy has arisen in the Computer Services Unit for an experienced Senior Systems Designer to work within the Health Service on behalf of the Computer Consortium of the Lothian, Fife and Borders Health Boards.

The post involves responsibility as project leader for a small team of designers and programmers working mainly on medical applications. Opportunities will be provided to work on financial and other application areas where appropriate.

The unit has ICL 1903T, 7502 and CMC 5200 equipment and there are off-line links to other sites.

Candidates should have considerable experience in computing and a proven ability to design and install complex systems. A relevant professional or academic qualification is desirable and knowledge and experience of computing in the Health Service would be an added advantage.

Further details and application forms can be obtained from the Personnel Officer, 11, Drumshaugh Gardens, Edinburgh, EH7 7QQ. To whom completed applications should be returned by 1st September, 1978. Please quote reference LHB/0278

## Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

### Block 11 (Physical Block)

Hex and Zap are still up in the mountains awaiting Cleo and Lambda, unaware of their plight; and now Ascii has disappeared.

"ASCII's gone!" Hex's shout woke Zap.

"Cool it, will you?" snorted Zap.

"But we're in trouble. We've got to do something."

"We always were. What do you suggest?"

"We'll have to go and find him."

"How?"

"By radar."

"You mean he won't maintain radio silence? Then we're better off without him," stormed Zap. "He'll lead the whole pack onto us."

Hex was infuriated by Zap's defeatist attitude. There were times when he clearly regretted leaving the security and logicity of the System to work alongside a bunch of crackpots. However on this occasion Hex had to admit he had a point.

"We could follow his tread marks," ventured Hex lamely. "And what happens when Cleo and Lambda arrive to find us gone?"

The exchange had gone badly for Hex, and he knew it. He took stock. His one really dependable ally was lost. The two girls were probably in dire straits, perhaps even in the hands of the Error Squad. Zap was subject to bouts of cantankerousness, and apparently believed that with their limited resources they could hope to achieve little more than a token Kamikaze mission. On top of this, they had neither offensive nor defensive weapons; and needless to say had yet to decide on a strategy. The outlook was undeniably bleak.

At that moment a small lump of earth, dislodged higher up the tunnel, rolled down and hit Hex in the back. He sprang up like a startled deer. From beyond their view came the sound of footfalls.

"Anyone at home?" echoed a tentative greeting.

Hex recognised Cleo's voice. His feelings were too strong and too mixed even to experience without perplexity, let alone to express. It was left to Zap to answer the call.

Shortly afterwards Ascii entered. Cleo followed, limping and supported by her sister.

"Sorry we're a bit late," said Cleo.

"Ascii scented us," added Lambda. "He came down to help us with the final ascent."



Hex could see that Cleo's knees were covered by two discs of caked blood, but her spirit was undimmed.

"I could do with a bath," she proclaimed. Hex led her, hobbling, down to the pool in the centre of the crater. She dipped a toe in the water. Immediately she recoiled. "It's hot!" she exclaimed. "It was freezing last time."

Hex immersed one finger, then his right hand. It was distinctly warmer than the previous morning when it had been lukewarm.

"We've got a warm spring," he replied. "I noticed it yesterday, but today it's a bit hotter. It could be medicinal. Go on, take the plunge!"

Before she could reply, Zap and Lambda had joined them, bent on horseplay, and moments later all four were splashing around in their private heated swimming pool like children, with Ascii barking excitedly on the water's edge.

After their dip, they made plans. As night fell they were engaged in deciding how to strike their first real blow against the Network. Hex favoured adapting Dr Null's concept and equipping Ascii as a gigotic de-stabilizer, to test the System's vulnerability to gigotic induction; but Zap had his own ideas.

"What do you know about gigotic processes?" began Hex.

"We had a lecture from Igor Gogolki himself in my first year at Brainstorm College," replied Zap. "He told us about the standard counter-measures."

"But Gogolki perished in Russia forty years ago."

"Well, he looked in good shape to me."

This not only undermined Hex's fundamental premise, it eroded his faith in Dr Null's last confession. While he tried to reconcile it with what he knew, Zap got into his main theme.

"The only way to blow the System's collective mind is with LSD."

It sounded like a blast from the past. "With what?" Hex queried.

"LSD — Large Scale Disintegration. I've thought it all out. The System depends on the integration of astronomical numbers of incredibly tiny components, all based on wafer-thin slices of a silicon substrate. It is literally built

## Consultancy

## SALES EXECUTIVES

### London Based

Are you a London based salesperson who can take charge of the Sales and Marketing for our RPG II division?

Due to our current and continuing expansion we require a top-level sales executive who can maintain our growing level of activity.

It is our intention that as the need for additional sales effort becomes necessary that you will assume the responsibility for control of the total RPG II sales and marketing effort.

A knowledge of IBM GSD or equivalent computer systems is desirable for both positions.

### QUOTA EARNINGS IN EXCESS OF £10,000 p.a.

If you think you have the qualifications and are prepared to accept the challenge and responsibility of one of the above positions contact me, Terry Wright, on 01-549-8933 during the day or 01-894-5418 evenings or weekend.

12 Canbury Passage, Richmond Road, Kingston-upon-Thames, Surrey KT2 5BG



**Eurologic Software Ltd.**

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